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TRANSACTIONS

OF THE

National Dental Association

AT THE

TENTH ANNUAL MEETING

HELD AT

Atlanta, Ga., September 18–21, 1906

PHILADELPHIA
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The National Dental Association, although formally accepting and publishing the reports of the various Sections, and the Essays read before the Association, holds itself wholly irresponsible for the opinions, theories, or criticisms therein contained, except when otherwise decided by special resolution.—*Constitution.*

CONTENTS.

PAGE

Disclaimer ..... *opposite*

Presiding Officers of the Former Associations:

Ex-Presidents of the American Dental Association viii
Ex-Presidents of the Southern Dental Association viii

Organization of the N. D. A.:

Officers ix
Executive Council ix
Executive Committee ix
Organization of Sections x
Committee on History x
" on State and Local Societies xi
" on Dental Journal xi
" on Jurisprudence and Suppression of Fraudulent Diplomas xi
" on International Relations as to Diplomas xi
" on National Dental Museum and Library xi
" on Oral Hygiene xii
" on Necrology xii
" on Publication xii
" on Army and Navy Dental Legislation xi
" on Clinics xiii
Section on Inlays xiii
Delegates to the Federation Dentaire Internationale, 1907 xii
Local Committee of Arrangements xiii

List of Members:

General List xiv
Permanent Members Without Dues xxiii

Tenth Annual Meeting,

ATLANTA, GA., SEPTEMBER 18–21, 1906.

GENERAL SESSIONS.

PAGE

First General Session 1
- Meeting called to order by President M. F. Finley 1
- Address of welcome delivered by Gov. J. M. Terrell 1
- Address of welcome from Georgia dentists read by Dr. D. D. Atkinson .. 2
- Reply to addresses of welcome, by Dr. B. Holly Smith 4
- President reads his annual address 6
- *Paper*—A paper from Section II read by Dr. Chas. S. Butler 6
- Report of Executive Council on invitation to be extended to F. D. I. to meet in the United States in 1908 6

Second General Session 6
- Report of Executive Council, by Dr. H. J. Burkhart 7

Third General Session 7
- *Paper*—A paper from Section III read by Dr. A. W. Harlan 7
- Report of Executive Council, by Dr. H. J. Burkhart, on publication of a dental journal, and recommending appropriate amendments to the by-laws 7
- Report from the Committee of Organization of the Fourth International Dental Congress, by Dr. H. J. Burkhart, chairman. Embracing the Report of the Finance Committee of the Congress (Chas. S. Butler, chairman); the Report of the Treasurer (M. F. Finley), and the Report of the Auditing Committee 7
- Vote of thanks tendered to the Committee of Organization of the Fourth International Dental Congress on the completion of their efficient work 13
- Meeting-place selected for 1907 13
- Election of officers 13
- Resolution that the appointment of officers of the sections and other committees be left with Executive Council 13

PAGE

Fourth General Session 13
Report of the Committee on Oral Hygiene, by J. P. CORLEY, chairman.. 13
Report of the Committee on Journal presented by Dr. H. J. BURKHART, chairman of Executive Council 17
Report of the Committee on Army and Navy Dental Legislation, by Dr. WMS. DONNALLY, chairman..... 19
Vote of thanks tendered to the chairman and members of the foregoing committee 30
Fifth General Session..... 30
Report of Executive Council, by Dr. A. H. PECK 30
Report of the Committee on Necrology 31
Report of the Committee on President's Address 33
Installation of officers and remarks of Dr. A. H. PECK upon accepting office as president..... 33
Various votes of thanks extended..... 35
Adjournment 35

EXECUTIVE COUNCIL.

Minutes of Proceedings 36-41
Reports presented:
Committee on the F. D. I..... 36
Special Committee on Journal..... 37
(Report printed with general sessions, at page 7)
Committee on Clinics 39
Auditing Committee 39
Committee on Credentials..... 39
Treasurer 40
Finance Committee Fourth International Dental Congress 41
(Report printed with general sessions, at page 8)
Resolution for the appointment of a committee of five on the "Educational Problem," to report at next annual meeting..... 38
Publication of Transactions awarded to *Dental Cosmos* 38
Resolution by Alabama dentists commending Senator Pettus for his interest in army and navy dental legislation 38
Above resolution recommended for adoption by the Association..... 39
Chairman of Committee on Oral Hygiene requested to appoint a committee to prepare an address for publication on that subject.... 39
Loan recommended in aid of Jamestown Congress 39

PAGE

Communication from Executive Committee commending Dr. DONNALLY's earnest and unselfish efforts at Washington..... 41

Resolutions commending the work of Dr. DONNALLY and his committee and appropriating $200 toward reimbursing him for money expended 41

Papers Read in General Session.

President's Address:

Annual Address of the President. By Dr. M. F. FINLEY..... 42

Papers:

"The Educational Problem." By Dr. CHAS. S. BUTLER..... 51

Discussion 57

"The Blue Light and Heat as Therapeutic Agents." By Dr. A. W. HARLAN 67

Discussion 68

SECTION I.

PROSTHETIC DENTISTRY, CROWN AND BRIDGE WORK, ORTHODONTIA, METALLURGY, CHEMISTRY, AND ALLIED SUBJECTS.

First Day 71

Paper—"Some Thoughts Concerning the Contact of the Teeth." By Dr. RICHARD SUMMA..... 71

Discussion 74

Paper—"Phases of Art in Prosthesis." By Dr. GEORGE H. WILSON..... 79

Discussion 84

Paper—"The Present Status of the Porcelain Inlay." By J. Q. BYRAM 88

Discussion 93

Second Day 101

Paper—"Orthodontia: Opening the Bite in the Regulation of Teeth: A Metal Flange for Improving the Anchorage of Appliances, for Moving Teeth, and for Harmonizing the Occlusion." By Dr. V. H. JACKSON..... 101

Discussion 112

PAGE

Paper—"Rubber-Dam Method of Abutment Preparation, Interchangeable Facings, and Cementation." By Dr. A. P. Burkhart.... 118
Discussion 122
Paper—"Reflected Shadows Accompanying Porcelain Fillings." By Dr. C. N. Thompson..... 124
Discussion 129
Paper—"Setting Crowns and Bridges with Gutta-percha." By Dr. L. G. Noel 130
Discussion 131
Paper—"Forcing Eruption: a Case in Practice." By Dr. H. Herbert Johnson 133
Discussion 136
Paper—"Comments on General Practice." By Dr. Wm. Leon Ellerbeck 138
Discussion 149
Paper—"The Ultimate Outcome of Crown and Bridge Work." By Dr. E. Parmly Brown..... 152
Adjournment 155

SECTION II.

OPERATIVE DENTISTRY, NOMENCLATURE, LITERATURE, DENTAL EDUCATION, AND ALLIED SUBJECTS.

First Day 157
Paper—"The Remarkable History of the Profession, and the Splendid Character of the Men of the Past who Helped to Build It Up." By Dr. Chas. McManus..... 157
Discussion 160
Second Day 164
Paper—"Prosthetic Nomenclature." By Dr. George H. Wilson.....164
Discussion 175
Paper—"Prophylaxis a Factor in Dental Education." By Dr. J. H. Crossland 179
Paper—"A Review of the Methods Employed for the Retention of Fillings." By Dr. H. Herbert Johnson 181
Paper—"Pressure Anesthesia and the Removal of Living Pulps." By Dr. N. C. Leonard..... 186
Discussion 192

PAGE

Paper—"Manual Training an Essential to Dental Education." By Dr. Burton Lee Thorpe 195
Paper—"A Vacancy in Dental Journalism." By Dr. Wm. H. Trueman 197
Adjournment 200

SECTION III.

ORAL SURGERY, ANATOMY, PHYSIOLOGY, HISTOLOGY, PATHOLOGY, ETIOLOGY, HYGIENE, PROPHYLAXIS, MATERIA MEDICA, AND ALLIED SUBJECTS.

First Day 201
Paper—"Treatment of Pyorrhea Alveolaris." By Dr. Gordon White 201
Discussion 217
Paper—"Lymphatic Stimulation in Dental Practice." By Dr. H. J. Allen 224
Discussion 229
Paper—"Oral Hygiene in the State Association." By Dr. E. P. Dameron 235
Discussion 237
Adjournment 237

THE CLINICS.

PAGE

Dr. J. A. Gorman—"Orthodontia" 239
" V. H. Jackson—"Orthodontia" 239
" A. W. Doubleday—"Combination Inclined Plane and Retaining Appliance" 240
" A. M. Jackson—"Contour and Occlusion Obtained With Cast Fillings Without Waxing or Investing"... 241
" I. N. Carr—"Combination Filling of Tin and Gold". 242
" W. H. Cudworth—"Porcelain Inlay Restoration of a Central Incisor" 242
" J. A. Hall—"A Temporary Lower Denture" 242
" E. P. Dameron—"The Use of Interchangeable Facings" 243

PAGE

Dr. C. H. Frink—"Porcelain Restoration of Malformed and Diminutive Laterals" 243
" F. E. Roach—"Moldable Porcelain, Showing its Uses and Manipulation"..... 243
" H. T. Stewart—"Bridge Work in Pyorrhea"..... 244
" J. H. Crossland—"Stomatic Prophylaxis"..... 244
" H. B. Tileston—"Hollow Gold Inlays"..... 245
" D. O. M. Le Cron—"Cavity Preparation for Gold and Porcelain Inlays, Showing Plaster Models".....246
" W. R. Clack—"Gold Filling" 246
" J. V. Conzett—"Gold Filling"..... 246
" A. P. Johnstone—"A New Method of Fitting Crowns and Making Inlays. Mounting Porcelain Crowns with Fixed or Detached Posts"..... 247
" D. H. Young—"The Carbon System of Constructing a Porcelain-face Crown" 247
" Crittenden Van Wyck—"The Van Wyck Obtunder" 249
" F. G. Crouch—"Orthodontia" 250
" L. A. Smith—"Method of Measurement for Ordering Facings, Crowns, Etc., for Special Cases"..... 250

Appendix.

Constitution of the National Dental Association. 252
Order of Business..... 260
Standing Resolutions 261
Rules of Order..... 262
Code of Ethics..... 263

Presiding Officers of the Former Associations.

Presiding Officers of the American Dental Association and of the Southern Dental Association prior to Consolidation.

Ex-Presidents of the American Dental Association.

1859. W. W. Allport, Chicago, Ill.
First meeting, for organization.
1860. W. H. Atkinson, Cleveland, Ohio.
1861. (No meeting.)
1862. George Watt, Xenia, Ohio.
1863. W. H. Allen, New York, N. Y.
1864. J. H. McQuillen, Philadelphia, Pa.
1865. C. W. Spalding, St. Louis, Mo.
1866. C. P. Fitch, New York, N. Y.
1867. A. Lawrence, Lowell, Mass.
1868. Jonathan Taft, Cincinnati, Ohio.
1869. Homer Judd, St. Louis, Mo.
Owing to a change in the constitution, officers elected at this and the sessions following served at the annual meeting subsequent to their election.
1870. W. H. Morgan, Nashville, Tenn.
1871. Geo. H. Cushing, Chicago, Ill.
1872. P. G. C. Hunt, Indianapolis, Ind.
1873. T. L. Buckingham, Philadelphia, Pa.
1874. M. S. Dean, Chicago, Ill.
1875. A. L. Northrop, New York, N. Y.
1876. Geo. W. Keely, Oxford, Ohio.
1877. F. H. Rehwinkel, Chillicothe, Ohio.
1878. H. J. McKellops, St. Louis, Mo.
1879. L. D. Shepard, Boston, Mass.
1880. C. N. Peirce, Philadelphia, Pa.
1881. H. A. Smith, Cincinnati, Ohio.
1882. W. H. Goddard, Louisville, Ky.
1883. E. T. Darby, Philadelphia, Pa.
1884. J. N. Crouse, Chicago, Ill.
1885. W. C. Barrett, Buffalo, N. Y.
1886. W. W. Allport, Chicago, Ill.
1887. Frank Abbott, New York, N. Y.
1888. C. R. Butler, Cleveland, Ohio.
1889. M. W. Foster, Baltimore, Md.
1890. A. W. Harlan, Chicago, Ill.
1891. W. W. Walker, New York, N. Y.
1892. J. D. Patterson, Kansas City, Mo.
1893. (Formal session only, owing to the holding of the World's Columbian Dental Congress; officers elected in 1892 holding over until 1894.)
1894. J. Y. Crawford, Nashville, Tenn.
1895. J. Y. Crawford, Nashville, Tenn.
1896. James Truman, Philadelphia, Pa.

Ex-Presidents of the Southern Dental Association.

1869. W. T. Arrington, Memphis, Tenn.
First meeting, for organization; Jas. S. Knapp being chairman *pro tem.*
1870. W. T. Arrington, Memphis, Tenn.
1871. Jas. S. Knapp, New Orleans, La.
1872. F. Y. Clark, Savannah, Ga.
1873. H. M. Grant, Abingdon, Va.
1874. Robert Arthur, Baltimore, Md.
1875. J. R. Walker, New Orleans, La.
1876. W. T. Arrington, Memphis, Tenn.
1877. W. G. Redmond, Louisville, Ky.
1878. S. J. Cobb, Nashville, Tenn.
1879. F. J. S. Gorgas, Baltimore, Md.
1880. J. B. Patrick, Charleston, S. C.
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1883. L. D. Carpenter, Atlanta Ga.
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1888. B. H. Catching, Atlanta, Ga.
1889. J. Y. Crawford, Nashville, Tenn.
1890. John C. Storey, Dallas, Tex.
1891. G. F. S. Wright, Georgetown, S. C.
1892. Gordon White, Nashville, Tenn.
1893. B. Holly Smith, Baltimore, Md.
1894. (Same officers held over.)
1895. H. E. Beach, Clarksville, Tenn.
1896. John S. Thompson, Atlanta, Ga.
1897. W. H. Richards, Knoxville, Tenn.

Organization of the N. D. A.

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Chas. McManus, 80 Pratt st., Hartford, Conn.
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Walton, J. Rowland, 700 10th st., N. W., Washington, D. C.
*Wardlaw, A. B., Greenville, S. C.
Warner, E. R., 401 California bldg., Denver, Colo.
Wassall, J. W., 1218 Stewart bldg., Chicago, Ill.
Waters, T. S., 756 N. Eutaw st., Baltimore, Md.
*Watkins, J. C., Winston, N. C.
Watkins, S. C. G., Fullerton ave., Mont Clair, N. J.
Weber, A. G., Corrales 1, Havana, Cuba.
Wedelstaedt, E. K., 204 N. Y. Life bldg., St. Paul, Minn.
*Weichselbaum, Wm., Savannah, Ga.
*Weinberg, A., Camden, S. C.
*Welch, T. J., Pensacola, Fla.
Welch, Geo. B., 1344 "G" st., N. W., Washington, D. C.
*Wells, W. D., Commercial Bank bldg., Macon, Ga.
*Westmoreland, W. W., Columbus, Miss.
Wheeler, Herbert L., 12 W. 46th st., New York, N. Y.
White, C. L., Bassett bldg., Oklahoma City, Okla.
White, Gordon, 610½ Church st., Nashville, Tenn.
White, W. A., Phelps, N. Y.
Whitfield, Geo. M., 215 S. 6th st., Newark, N. J.
*Whitman, A. B., Orlando, Fla.
*Whitsett, W. G., Lebanon, Tenn.
Whitslar, W. H., 29 Euclid ave., Cleveland, Ohio.
*Wiber, D. E., 1329 "F" st., N. W., Washington, D. C.
*Williamson, N. A., Prince st., Knoxville, Tenn.
*Wilson, F. C., 117½ Jones st., Savannah, Ga.
Wilson, Geo. H., 44 Euclid ave., Cleveland, O.
*Wise, J. D., West Point, Miss.
*Wolfe, L. S., 1114 "F" st., N. W., Washington, D. C.
*Womack, C. F., Martinsville, Va.
*Wood, F. L., Roanoke, Va.
Woodbury, Frank, 137 Hollis st., Halifax, Nova Scotia.
*Woodbury, G. M., Augusta, Ga.
Work, C. M., Ottumwa, Iowa.
*Wright, W. R., 32½ Capital st., Jackson, Miss.
*Wyatt, Thomas M., Bentonville, Ark.

Yerkes, H. P., Bucks bldg., Doylestown, Pa.
Young, D. H., Attica, N. Y.
Young, J. L., 63 W. 49th st., New York, N. Y.
Young, L. A., 4633 Maryland ave., St. Louis, Mo.

*Zirkle, W. M., English-American bldg., Atlanta, Ga.

PERMANENT MEMBERS WITHOUT DUES.

The following members are "permanent without payment of dues," under Standing Resolution No. 10, by virtue of having been in reputable practice for a period of fifty years:

FIELD, GEO. L., 4 Adams ave., W., Detroit, Mich.

FUNDENBERG, W. F., Lewis bldg., Pittsburg, Pa.

HEWITT, A. C., 2104 Kenmore ave., Chicago, Ill.

HOLMES, E. S., 8 New Aldrich bldg., Grand Rapids, Mich.

LYMAN, A. E., Melbourne, Fla.

MARSHALL, E. B., Rome, Ga.

MOORE, J. HALL, Richmond, Va.

PALMER, CORYDON, Warren, Ohio.

PEIRCE, C. N., Philadelphia, Pa.

Surviving Charter Members of the Southern Dental Association.

The following surviving charter members of the Southern Dental Association are "permanent members without dues":

ARRINGTON, B. F., Goldsboro, N. C.

AUGSPATH, LOUIS, Little Rock, Ark.

BOYD, H. D., Troy, Ala.

BROWN, J. P. H., Augusta, Ga.

BURR, W. H., Madison, Ga.

CARPENTER, L. D., Atlanta, Ga.

COLE, W. T., Newnan, Ga.

COOKE, W. H., Denton, Texas.

FRIEDRICHS, G. J., 641 St. Charles ave., New Orleans, La.

GORGAS, F. J. S., 259 N. Eutaw st., Baltimore, Md.

LOWRANCE, H. A., Athens, Ga.

MCDONALD, R. H., Griffin, Ga.

RAMBO, SAMUEL, Montgomery, Ala.

TIGNER, J. A., Rome, Ga.

TENTH ANNUAL MEETING

OF THE

National Dental Association,

HELD AT

ATLANTA, GA., SEPTEMBER 18–21, 1906.

TUESDAY—First General Session.

THE tenth annual meeting of the National Dental Association was held at Atlanta, Ga., September 18 to 21, 1906, in the ball-room of the New Kimball House.

The first general session was called to order at 10 o'clock Tuesday, September 18th, by the president, Dr. M. F. Finley, Washington, D. C.

Rev. Dr. Junius W. Millard, Atlanta, Ga., invoked divine blessings on the deliberations of the association.

The President then introduced Governor J. M. TERRELL, who delivered the following

Address of Welcome.

Mr. President, ladies and gentlemen,—It is always a pleasure to me as governor of the greatest state in the American Union—the state of Georgia—to welcome to our midst a national association. I am more than pleased this morning to welcome to our midst this great association, representative of one of the oldest professions—that of dentistry. We read that it was one of the learned professions in the days of the ancient Egyptians and Greeks; in fact, I have seen it somewhere stated that mummies have been found having bridge work in their mouths—and I have no doubt that all your patients who are having bridge work inserted in their mouths regret that they are not mummies for the time being. My own association with dental surgeons has been of the most pleasant character. None of you have ever given me the slightest pain. I have never been called upon to occupy a seat in the dental chair. But there are a great many in Georgia who have occupied those seats—as you will no doubt con-

clude when you inquire—as you see the fine carriages, autocars, and teams going along the public ways—whose carriage it is, whose autocar it is, or whose team it is. You will be told that it belongs to some member of your profession in the city of Atlanta; then you will at once say that there must have been a great many people occupying dental chairs in the Gate City of the South.

My friends, I am always glad when a citizen of another state comes to Georgia, comes here to spend several days, because I know that when that person returns to his home he will become a walking advertisement of Georgia's greatness. Now, this weather which we are giving you this morning is solely for the purpose of showing you all sorts of welcome. In a few hours the sun will come out, and you will see here, in September, a pretty spring day; and tomorrow we will give you another almost typical spring day. We hope that when you go out into the streets of our city you will feel that you are walking the streets of the capital city of one of the splendid states of the South, that always welcomes strangers to her midst.

Pardon me, Mr. President, if I remind these friends that when they go to their grocer's to purchase almost any article of food, and ask for the best, the grocer will always tell them, "We have Georgia syrup, Georgia peaches, Georgia melons. etc." And if you want to build a house, and go to the lumber merchant and ask for the best material, he will say, "We have Georgia pine"; and if you want to build a house of marble or granite, and inquire in the market as to the best marble or granite, you will be told that the Georgia marble or the Georgia granite is the best. In this connection we want you to feel, ladies and gentlemen, that the Georgia welcome is the very best.

And now, speaking not only for the city of Atlanta but for the entire state of Georgia, I want to bid you a most cordial welcome, and to hope that your meeting here will not only do us good but also do you good, and that you may return to your homes with the knowledge that you have not only spent a pleasant week in the state of Georgia, but that you have spent one that has benefited the state and also benefited yourselves. Again I bid you a most hearty welcome to our midst.

The President. I now have the pleasure, ladies and gentlemen, of introducing to you Dr. D. D. Atkinson of Brunswick, Ga., who will give you an additional welcome from the dentists of the state.

Welcome from Georgia Dentists.

Dr. D. D. Atkinson, Brunswick, Ga. *Mr. President, ladies and gentlemen,*—In behalf of the dentists of Georgia, I have the honor to welcome you to our state. Georgia is a great state; she has a great governor; she is great in her diversity of soil and climate, great in her agricultural and mineral products, great in her industrial pursuits; she is great in her history, but greatest of all in the genial hospitality of her citizens; and since we, the dentists of Georgia, are to be your hosts on this occasion, I think it would perhaps be well for me to tell you some of the characteristics of the Georgia dentist. First of all, he is an affable, kind, clever, and polished gentleman. He is very quiet, unassuming, reticent at home—if he is a married man—but extremely long-winded in society meetings. You may expect to find him so. He tries everything new that comes along. He has tried everything, from

the "new departure" of the past to the porcelain inlays and gold inlays of the present in all of their multitudinous and differential forms; holds fast to all that is good, and to a great deal that is bad. He is quite industrious. One of them once said on the floor at one of our meetings—and I am glad Dr. Crawford is here, because he can verify this—that he himself had made fifteen hundred plates in a single year, and that the statistics show that it had been an off year for mechanical dentistry.

Another of the characteristics of the Georgia dentist is that when he finds a good thing he sticks to it, and pushes it, sometimes to extremes. I do not know of a better way to illustrate this tendency on his part than by relating a little incident which occurred at a meeting of our state dental examining board. Before the state board there were a number of applicants for license, among them a young man to whom the following question was put: "What would you do in case of pericementitis?" His answer was, that he would paint the gums with aconite and iodin. The examiner said that it was a good answer, but added, "Suppose that such an application would not relieve the pain, what would you do?" He said, I would paint the gums again." "But again suppose it would not relieve it, what would you do?" "Paint them again," he replied. "But once more suppose that it did not relieve the pain, what would you do?" He said, "I would paint them again." "Now," said the examiner, "you have painted the gums four times, and the next morning the patient returns in agony, the teeth so sensitive that you can hardly touch them, the epithelium destroyed by the previous applications, the gums raw, and the patient suffering terribly. Now what would you do?" He very calmly answered, "I would paint them again, sir."

One other characteristic of the Georgia dentist—or I may say the Atlanta dentist—is that he is very moderate in his charges, and if there is a citizen of Atlanta present he will bear me out in that statement. A few days ago a wealthy gentleman came into the office of a distinguished Atlanta dentist, and told him that he wanted to have his wife's teeth attended to. The dentist answered, "Why, certainly." "Before you start," the gentleman said, "I wish to make a proposition as to terms." The dentist said that such a plan was agreeable to him, as it was always best for all concerned to reach an understanding beforehand. The gentleman then made the following proposition: "I will give you in payment of your bill a straight deed to all of my property, if you will be kind enough to take my note for the balance." The dentist was not at all staggered, but said, "Well, sir, I never like to appear unreasonable, so I will accept your proposition provided you will get a good and solvent indorser for your note."

When I see before me gentlemen from every state of this vast republic, men who have consecrated their lives and talents to original scientific research, men who have from their youth held aloft the banner of professional integrity, who have built monuments in our literature, and added to the history of this great nation a bright page for the dentistry of this age, I realize that we have assembled here the genius of American dentistry, which has no superior and no equal anywhere in the civilized world. If you had come to us today, gentlemen, bringing mercenary precepts; if you had come to us representing that which we in Georgia call the commercial side of den-

tistry; if you belong to that class of men who would prostitute their profession for the sake of the sordid dollar, you would find no welcome in Georgia today. Our governor would be in his seat at the Capitol; your humble servant would be at his home by the sad sea waves, pursuing the even tenor of his way; these other gentlemen would be in their respective offices, and you would be left to conduct your affairs in your own way. But when you come, as you do, with authority to speak for the ethical dentistry of all America; when you come holding high the colors of professional unity and social life, bringing hope to our young men and inspiration to all, Georgia opens her arms to receive you; we are proud to claim you as our guests.

In this meeting, gentlemen, you will review the events of the past; you will establish the accomplishments of the present; you will design the great work of the future, and I beg to trespass just so much upon your domain as to tell you that the dentistry of the future will look more than ever to the educated man. The dentistry of the twentieth century looks to the young man who first equips himself with a broad, liberal college education that he may go out into the world and measure man to man with all men, that he may carry dignity and respect in his vocation. For such men dentistry offers new and honorable employment, a safe and increasing field for thought, where industry and frugality yield good returns, and where he can be a blessing to his fellow man. But he must recognize —every man must recognize—that he is the architect of his own fortune; every tub must stand upon its own bottom, and over all, above and beyond, there is an old saying that is true today, that was always true, true before it was written: "Whatsoever a man soweth, that shall he also reap."

We welcome you, gentlemen, to the state of Georgia and the city of Atlanta.

The President. I now have the pleasure of introducing to you a gentleman whom all love, and who has the happy faculty of saying the right thing in the right way, Dr. B. Holly Smith, who will respond to the addresses of welcome.

Reply to Addresses of Welcome.

Dr. B. Holly Smith, Baltimore, Md. *Your Excellency Governor Terrell, Dr. Atkinson, Mr. President, ladies and gentlemen,*—It is indeed a pleasure and a privilege to thank you for these words of hearty welcome. We feel that to have your excellency the governor of the great commonwealth of Georgia with us is a pleasure and an honor. I am sure that I cannot adequately express what we feel, as I can boast no great familiarity with governors. Perhaps if you were the governor of North Carolina I might be able to make the proper response. I will say, however, that I feel a little nearer to your excellency because the governor of my own state, our much beloved Warfield, once studied dentistry; that is to say, he spent about one term trying to determine whether he possessed the high attainments which would make of him a dentist, and he decided in the negative. He drifted out of dentistry, and finally into the gubernatorial chair.

Now, we are very proud of our governor. He is, perhaps—with the exception of the governor of Georgia—the handsomest governor in the United States. And I think he is a formidable candidate for the vice-presidency on the democratic ticket. It is Us and William J.

But seriously, Governor Terrell and Dr. Atkinson, we appreciate your warm words of welcome. We are glad to see, many of us for the first time, the material evidences of the regeneration of this beautiful Southland. We are glad to see in your homes and on your streets the evidences of those gentle manners that have, wherever southern men have gone, given a newer and broader interpretation to that grand old word—gentleman. We are glad that the commercial spirit so rife in our country today has not robbed you of the sweet tender modesty, the grace and beauty of the women of your homes. May this secret source of your gentle power be forever preserved.

We are glad to feel that we are in the home town of the immortal Grady; to hear in memory the ringing eloquence of his words, and to think that the influence of his work and worth has been stamped upon the character and lives of the people of this great state. We congratulate you upon the mingling of urban and suburban features in your city. Your citizens are wakened in the morning by the songs of birds, and look out of their windows upon the graceful foliage of the sycamore, elm, and other trees; how could this community be other than blessed and happy?

We come to you at an important era in the history of this great association. Formed as it was by the union of the Southern and the American Dental Associations, its history records the lives and work of the great men of American dentistry, whose effort has been a continuous one for the uplift of dentistry. Helpfulness has been the watchword. Looking back upon the lives of these men, may we not receive inspiration and hope for greater effort ourselves? In the history of all new organizations we find men who, perhaps with no well-defined plan of their own, object to the existing order of things. Destructive criticism has always gone hand in hand with constructive progress. We do not raise our hands in warning, but would say, Come every one, from whatever quarter, and bring with you a portion of rich humus to fertilize the roots of this tree. Prune it if you know how, but stand by its trunk. Guard it with your lives. May we not say, with Solomon's Song, "Awake, O north wind, and come, thou south, and blow upon my garden, that the spices thereof may flow out."

The Executive Council, through its chairman, Dr. H. J. Burkhart, offered the following report: The Executive Council reports the printed program as the program for the meeting. Such changes as may be made by the officers and the Executive Council will be announced at the subsequent sessions. The program for this meeting will consist of the President's address, which will be referred to a committee, and this will be followed by a paper by Dr. C. S. Butler.

The customary report of the Executive Council will be made at the morning session, as we have not had time for a formal meeting of the Council so far.

I desire to state to the members that the Council meets in Room 102 on the next floor below. They will be in session in about half an hour, and at various times during the meeting, and they cordially invite any and every gentleman in this association that may see fit to come there and present any matters of business. I can assure you that they will receive a full hearing, and if they should wish a further hearing, the Executive Council with the consent of the association will

call a meeting in this room and will thus give them an opportunity to be heard before such larger number of members as may choose to be present.

The PRESIDENT. If there be no objection raised, the report of the Council will be adopted.

There being no objection, the President declared the report adopted.

Dr. Frank Holland, Atlanta, Ga., vice-president from the South, was called to the chair, and the president, Dr. M. F. FINLEY, read his annual address. (See page 42.)

Dr. B. HOLLY SMITH. I move you, sir, that this address be referred to a committee of three to report to the association on the recommendations therein contained.

The motion was carried.

Dr. Holland appointed as such committee the following: Dr. B. Holly Smith, Baltimore; Dr. John I. Hart, New York, and Dr. H. B. Tileston, Louisville.

Dr. Finley resumed the chair and introduced Dr. CHAS. S. BUTLER of Buffalo, N. Y., who read a paper entitled "The Educational Problem." (See page 51.)

The subject of Dr. Butler's paper was passed, and the next order of business was the report of the Executive Council, by the chairman, Dr. BURKHART, as follows:

The Council recommends that a resolution which was submitted to them by the delegates to the International Dental Federation representing this association, to the effect that an invitation be extended to the International Dental Federation to meet in the United States in 1908, be adopted, and that we extend to the Federation an invitation to meet here at that time, and that the officers of this association be instructed to formulate that invitation in due form. The Council also recommends that the usual appropriation of fifty dollars be made to the International Dental Federation.

We also wish to report that the chairman of the Committee on Journal, Dr. Kimball, has made a report to the Council, and that this matter, together with the president's recommendations, will be presented to the Council this afternoon by a special committee.

We also wish to report that the resignations of Dr. A. L. Northrop of New York city and Dr. W. P. Dickinson of Minneapolis, Minn., have been accepted.

We also report that Section I will meet in this room this afternoon, and also that when this session adjourns we will take a rest until 7.30 this evening to receive further reports from the Council, the Executive Committee, and the officers of the association.

The report of the Council was on motion adopted.

Dr. C. N. Johnson, a member of the Executive Committee, being absent, the President appointed in his stead Dr. C. M. Work of Ottumwa, Iowa.

The general session then adjourned until 7.30 P.M.

TUESDAY—Second General Session.

The second general session was called to order by the president, Dr. M. F. Finley, at 8 P.M. Tuesday, September 18th.

The Executive Council, through its chairman, Dr. BURKHART, reported as follows:

The Executive Council reports that at its meeting this afternoon a report was received from the delegates of the association to the International Dental Federation, and was referred to the Publication Committee to be printed in the Transactions. (See page 36.)

The Council also reports that in deference to the wishes of a very considerable number of the members of the association, who have felt that the election of officers was held at a time when many could not be present, and for the purpose of giving all an opportunity to express themselves, we recommend the suspension of the rules, and that the election be held tomorrow, Wednesday, at one o'clock.

On motion the report of the Council was adopted.

The general session then adjourned until Wednesday at 1 o'clock.

WEDNESDAY—Third General Session.

The third general session was called to order on Wednesday morning September 19th, at 12 o'clock, by the president, Dr. M. F. Finley.

The first order of business was the reading of a paper by Dr. A. W. Harlan, New York, on "The Blue Light and Heat as Therapeutic Agents." (See page 67.)

The next order of business was the report of the Executive Council, through its chairman, Dr. H. J. Burkhart:

The Executive Council recommend the acceptance of the invitation of the dentists of Atlanta to attend a barbecue this afternoon, and we recommend the postponement of the section meeting that was scheduled for three o'clock.

I would ask the members of the association to give close attention to the matters which I will bring before you at this time, because in the judgment of the Council they affect the association members more vitally than any matters which have come before the association in a long time. The matter of publishing a dental journal has been agitated for some time, and I am happy to tell you that after a considerable amount of time spent in consultation and discussion, the Council is of the opinion that with the amendments which are to be offered today, and with what can be accomplished by the officers of the association before the next meeting, that, commencing with the next meeting of the association in July or August, you will have a journal of your own. The committee recommends the following amendments to the by-laws, which under the rules will have to be laid over until next year before final action thereon:

Art. V, Sect. 2:

Add to the section—"of which so much shall be set aside as shall be necessary to secure for the member a subscription to the Journal of the National Dental Association."

Art. V, Sect. 3:

Insert after "branches"—"nor be entitled to receive the Journal of the National Dental Association."

(Signed) Chas. O. Kimball, *Chairman,*
E. K. Blair,
J. Y. Crawford,
Committee.

The Council recommend that these amendments be presented, and laid over under the rules until next year.

I have further to report that the Transactions for the coming year have been awarded to the *Dental Cosmos*, under the same conditions as last year, with the exception that members reading papers who wish illustrating done other than that which the editor of the journal sees fit to have done for the purpose of explaining their papers, must themselves pay for the same.

We wish to report as the program for this evening's session the meeting of Section III, at 8 o'clock, at which time will be read papers

by Dr. Gordon White and Dr. H. J. Allen. The program for tomorrow will consist of a paper by Dr. Corley, with some recommendations which we will make with reference to the publication of a treatise on Hygiene of the Mouth, which will be considered at that time.

I wish to bring another matter to the attention of the association. It was ordered by the Committee of Fifteen of the Fourth International Dental Congress that the cases containing models, etc., which were exhibited at the St. Louis Congress, be turned over to the Army Medical Museum at Washington. We are informed that that has not been done, and it is recommended by the Executive Council that the association instruct its secretary to request the gentlemen who has charge of these models and cases to at once turn them over to the Army Medical Museum.

On motion the report of the Executive Council was adopted.

Report of the Committee of Organization of the Fourth International Dental Congress.

Dr. Burkhart then made a report from the Committee of Organization of the Fourth International Dental Congress, as follows:

It was agreed by this association and the committee acting for it, that a full and detailed statement would be made to this association and to the profession at large at the close of the congress with reference to the receipts and disbursements of the congress funds. I have here the report from the chairman of the Finance Committee, which gives in detail all the sources of revenue to the congress. I have to present also the report of the Treasurer of the congress:

I. REPORT OF THE FINANCE COMMITTEE OF THE FOURTH INTERNATIONAL DENTAL CONGRESS.

Mr. Chairman and Gentlemen,—In submitting herewith the report of the Finance Committee of the Fourth International Dental Congress, we desire first of all to express our appreciation of the courtesy, consideration, and uniform confidence displayed toward us by your committee, and the widespread and universal trust in our integrity and purpose by the profession at large. This mutual trust and confidence left the committee with a free hand and enabled it to enter upon and prosecute its important work to a successful conclusion. On accepting appointment on this committee our first duty appeared to be to study the scope and financial need of the congress, and to formulate, as nearly as might be, an estimate of the probable expense attending its organization and work. Naturally we turned first of all to the published proceedings of the Columbian Congress, thinking that the expense and results of that gathering would assist us materially in the work we had undertaken; but to our surprise and astonishment, no financial report of that congress could be found, and an appeal to the officers charged with the duty of financing it threw no light upon the subject whatsoever, so that we were compelled to devise and develop measures of raising money without any assistance from the experience of those preceding us in similar undertakings. The first work of your committee, therefore, and that as a basis upon which to found their efforts, was to formulate a careful estimate of the total expenses probably necessary to organize, conduct, and complete the work of such a congress; secondly, what percentage of the required amount could be derived from membership fees; and thirdly, from what sources the balance of the funds might be procured.

After giving to these questions such study as time and available experience would permit, it was estimated that from $28,000 to $30,000 would be necessary to complete the work along the lines already projected by your committee; and that from $15,000 to $18,000 of this amount could probably be derived from membership fees (see minutes of the Chicago meeting of your committee). But just here arose an unexpected and most perplexing problem, occasioned by the decision of your committee already announced, to present to each member the bound proceedings of the congress, for a fee of ten dollars, we having estimated that to report, edit, print, bind, and deliver the Transactions, would cost a sum equal to if not in excess of that fee, so that we were confronted at the start with the necessity for raising from $12,000 to $15,000 from sources other than

that of membership fees. This, in the judgment of your committee, should be done, if possible, without asking for personal subscriptions from individual members of the profession, as is usual with such gatherings.

Four avenues for raising this amount seemed open to us, namely—First, dental exhibits; second, dental societies; third, dental colleges; and fourth, dental manufacturers and dealers. The first of these was certain to yield something, as it had been already decided to make dental exhibits a feature of the congress; the second seemed reasonably certain, as we felt sure that the whole profession was deeply interested, and through its organization would do what it could to make the congress a success. The third was somewhat problematic, as most if not all of our schools were experiencing difficulty in meeting their own necessary expenses; while the fourth was felt by many to be without any promise whatsoever. However, the needs were imperative, the objects worthy, and it was believed by your committee that upon a fair presentation of the matter the manufacturers and dealers would willingly come to our assistance, and it is with the greatest gratification that we are able to report that in this, as in all other matters pertaining to the finances of the congress, we were not disappointed, as will be shown by a detailed statement of receipts appended to this report.

In all the work of your committee there was nothing more gratifying than the encouragement and assistance which we received from the dental manufacturers and dealers, and we are glad to believe that, in their cordial response to our appeal, something of the unwarranted though real antagonism between them and the profession existing through so many years has been broken down; and if we are right in thus believing, this result, if it were the only one growing out of this most successful congress, would be worth its entire cost of money and effort. Two other experiences were also extremely gratifying to your committee, and we believe they will be also to the entire profession—namely, first, that every subscription to the Congress Expense Fund that was made unconditionally was paid promptly and in full; and second, that out of the hundreds of personal checks received from almost every city and town in the United States, not a single one was protested—a showing we believe not experienced in any other enterprise of like magnitude, and testifying to the high character and honest purpose of the individual members of the congress; and your committee feels that it would be derelict to its privilege and opportunity did it not in this public manner bear testimony to this expression of professional integrity.

The itemized statement of the receipts of the congress from all sources is as follows:

Dental Exhibits.

1904.			
April	11.	Dr. Gallie, chairman committee	$1,000.00
May	28.	Dr. Gallie	850.00
Sept.	2.	" " cash	258.00
"	2.	" " checks	2,707.49
"	2.	" " "	176.31
"	21.	" " "	181.90
Oct.	17.	" " "	39.72
Nov.	3.	" " (B. Holly Smith)	700.00
			$5,913.42

Contributions from Dental Societies.

1903.			
Sept.	28.	National Dental Association	$500.00
Oct.	14.	Buffalo Dental Association	25.00
"	28.	Fourth District Dental Society, N. Y.	25.00
Nov.	14.	First District Dental Society, N. Y.	250.00
"	19.	Pennsylvania State Dental Society	250.00
Dec.	1.	Eighth District Dental Society, N. Y.	100.00
1904.			
Jan.	27.	Syracuse Dental Society, N. Y.	25.00
Feb.	9.	Chester and Delaware County Societies, Pa.	10.00
"	15.	Rhode Island State Dental Society	15.00
"	15.	Colorado State Dental Association	50.00
"	15.	Denver Dental Association	50.00
"	29.	Maine Dental Society	25.00
"	29.	Fraternal Dental Society, St. Louis	50.00
March	3.	Odontographics, Kansas City	50.00
"	9.	Reading Dental Society	15.00
"	18.	American Society of Orthodontists	50.00

March	22.	District Columbia Dental Society	$100.00
"	28.	Virginia State Dental Association	25.00
April	11.	Institute Dental Pedagogics	200.00
"	11.	Maryland State Dental Society	50.00
"	18.	Detroit Dental Society	41.00
"	18.	Jean J. Loizeaux, Boston	1.00
"	22.	New York Institute Stomatology	50.00
"	29.	Metropolitan District Dental Society, Mass.	50.00
May	3.	New York Odontological Society	200.00
"	4.	Fifth District Dental Society, N. Y.	50.00
"	4.	American Academy of Dental Science, Boston	50.00
"	6.	Valley District Dental Society, Mass.	15.00
"	6.	S. E. District Dental Society, Mass.	10.00
"	7.	Rochester Dental Society, N. Y.....	28.00
"	11.	Central District Dental Society, Mass.	25.00
"	17.	Iowa State Dental Society	100.00
"	19.	Third District Dental Society, N. Y.....	50.00
"	20.	Harries Dental Society, Pa.	10.00
"	21.	Sixth District Dental Society, N. Y.....	50.00
"	21.	Illinois State Dental Society	300.00
"	24.	Lake Erie Dental Society, Pa.	50.00
"	25.	Eastern Dental Society	25.00
"	26.	Texas State Dental Society	200.00
"	31.	Kentucky State Dental Association	100.00
"	31.	Utah State Dental Association	22.00
June	3.	Susquehanna Dental Association	25.00
"	6.	Second District Dental Society	100.00
"	13.	Southern Wisconsin Dental Association..	25.00
"	14.	Lebanon Valley Dental Association, Pa.	15.00
"	17.	Columbus Dental Society	20.00
"	17.	Cleveland Dental Society	50.00
June	20.	Alumni Association, N. Y. College of Dentistry	$25.00
"	20.	Pennsylvania Association Dental Surgery	43.00
"	24.	Milwaukee Dental Society	10.00
"	28.	Lehigh Valley Dental Society	10.00
"	29.	Massachusetts Dental Society	50.00
July	1.	Dallas Dental Society	15.00
"	7.	North Carolina Dental Society	159.00
"	7.	Dental Society of the State of New York..	400.00
"	8.	Luzerne and Lackawanna Dental Society, Pa.	10.00
"	11.	Indiana State Dental Association	50.00
"	12.	Toledo Dental Society	25.00
"	12.	Academy of Stomatology, Philadelphia ...	69.00
		Ditto (June 7, 1905)..	31.00
"	13.	Southern California Dental Association ..	12.50
"	13.	Los Angeles Association of Dental Alumni	12.50
"	13.	California State Dental Association	50.00
"	15.	Chicago Dental Society	100.00
"	16.	Harvard Odontological Society	10.00
"	18.	Jefferson County Dental Society, N. Y.....	10.00
"	19.	Psi Omega Fraternity, Pittsburg, Pa.	150.00
"	19.	Lynn Dental Society, Mass.	10.00
"	25.	Wisconsin State Dental Society	100.00
"	26.	New Hampshire Dental Society	25.00
"	29.	Georgia State Dental Society	100.00
"	29.	Lycoming County Dental Society, Pa.	.. 10.00
Aug.	3.	Connecticut State Dental Association	200.00
"	4.	Odontological Society, Cincinnati, O.	25.00
"	10.	Kansas State Dental Association	100.00
"	11.	New Haven Dental Society	25.00
"	15.	South Carolina State Dental Society	50.00
"	15.	San Francisco Dental Association	20.00

Aug.	16.	Michigan State Dental Association	$100.00
"	17.	Ohio State Dental Society	100.00
"	17.	Northern Ohio Dental Association	50.00
"	18.	Seventh District Dental Society, N. Y.	50.00
"	22.	Tennessee State Dental Association	100.00
"	23.	Southern Branch, N. D. A.	150.00
"	26.	Mississippi State Dental Society	50.00
"	29.	Southern Branch, N. D. A. (second)	150.00
"	29.	Odontological Society, Chicago	200.00
Sept.	1.	New Jersey State Dental Association	200.00
"	21.	Detroit Dental Society (second)	1.00
"	27.	National Dental Association (second)	500.00
1905.			
Jan.	19.	Utah State Dental Society	6.00
March	20.	Northeastern Dental Association, Connecticut	100.00
Total			$7,191.00

Contributions from Dental Colleges.

1904.			
March	4.	Philadelphia Dental College	$50.00
"	23.	Kansas City Dental College	10.00
"	26.	Dental Department University of Buffalo	50.00
April	11.	Ohio College Dental Surgeons	40.00
"	11.	College of Dentistry, University of Southern California	20.00
"	27.	Indiana Dental College	25.00
May	12.	Dental Department, University of California	50.00
"	18.	Baltimore College of Dental Surgery	50.00
"	21.	New York Dental School	25.00
June	17.	New York College of Dentistry	50.00
July	5.	Harvard University, Dental Department	50.00
"	9.	Medico-Chirurgical College, Dental Department	100.00
July	13.	College Physicians and Surgeons, San Francisco	$50.00
Nov.	11.	University Ann Arbor, Dental Department	20.00
Dec.	19.	University of Tennessee, Dental Department	25.00
Total			$615.00

Contributions from Dental Dealers.

1904.			
Oct.	31.	The S. S. White Dental Mfg. Co.	$500.00
Jan.	9.	E. de Trey & Sons, Philadelphia	10.00
"	13.	Kress & Owen Co., New York	20.00
"	13.	John T. Nolde Mfg Co., St. Louis	100.00
"	16.	Dentists' Supply Co., New York	25.00
"	20.	Mrs. W. M. Herriot & Son, Indianapolis	25.00
March	23.	McKesson & Robbins, New York	50.00
"	29.	Oakland Chemical Co.	50.00
April	2.	Friend	50.00
"	2.	Sanitol Co., St. Louis	50.00
"	18.	Dental Protective Supply Co.	100.00
June	17.	Cogswell Dental Supply Co.	25.00
July	28.	W. V-B. Ames, Chicago	25.00
"	28.	Lambert Pharmacal Co., N. Y.	25.00
Aug.	1.	Noah Spears Co., Dallas, Tex.	10.00
"	1.	Lee S. Smith & Son, Pittsburg	50.00
"	11.	J. W. Ivory, Philadelphia	50.00
"	22.	Dutro & Hewitt Dental Depot	25.00
"	22.	Johnson & Lund Dental Depot	25.00
"	24.	Hance Bros. & White, Philadelphia	5.00
"	29.	Consolidated Dental Mfg. Co., Cleveland	10.00
Sept.	7.	A. C. Clark & Co., Chicago	25.00
"	8.	*Dental Brief* (L. D. Caulk, Philadelphia)	50.00
Oct.	13.	Buffalo Dental Mfg. Co.	100.00
1906.			
March	9.	Hisey Dental Mfg. Co., St. Louis	25.00
			$1,430.00

Total contributions from all sources	$15,149.42
1587 members at $10.00 each.....	15,870.00
Making a grand total of.....	$31,019.42
Received for medals	110.00
" " cases	9.00
Total receipts	$31,138.42

This, as your Treasurer's report will show, is ample to meet all the financial obligations of the congress in full, leaving a small balance in the treasury.

In conclusion, your committee owes it to itself to state that the total expense for raising this large sum of money, registering the membership, and the many expenses attending it, was about 0.04 per cent., an exhibition in financing dental congresses not previously realized, and only obtainable in this instance because of the fact that the great bulk of the clerical work was performed by the chairman and his secretary, without expense to the congress.

Respectfully submitted,

Charles S. Butler, *Chairman*,
Waldo E. Boardman,
Charles McManus,
R. Hamill D. Swing,
R. M. Sanger,
Congress Finance Committee.

II. REPORT OF TREASURER, FOURTH INTERNATIONAL DENTAL CONGRESS.

To September 17, 1906.

RECEIPTS.

Dr. C. S. Butler, Chairman Finance Committee.....	$31,138.42
Dr. Arthur S. Black, refund; section expenses.....	3.00
Bank interest.....	407.47
	$31,548.89

EXPENDITURES.

Committee of Organization.....	$8,712.25
State Chairmen.....	1,336.37
Sections, clinics, and St. Louis Exposition	2,814.33
Finance Committee.....	1,701.95
Secretary's office.....	2,920.20
Bailey, Banks & Biddle, prize medals	250.00
S. S. White Co., Transactions....	11,799.91
National Dental Association, refund	500.00
Southern Branch, N. D. A., refund	$300.00
California earthquake sufferers...	750.00
	$31,085.01

Total receipts.....	$31,548.89
" expenditures	31,085.01
Balance	$463.88

Respectfully submitted,

M. F. Finley,
Treasurer Fourth Congress.

III. REPORT OF AUDITING COMMITTEE.

Atlanta, Ga., Sept. 17, 1906.

To the Organization Committee of the Fourth International Dental Congress:

Gentlemen,—The undersigned committee, appointed by the president of the National Dental Association to audit the finance accounts of the Fourth International Dental Congress, would report that they have carefully gone over the books, vouchers, receipts, and checks of the treasurer and of the chairman of the Finance Committee, and have found them correct in every particular.

S. H. Guilford,
J. P. Gray,
V. H. Jackson,
Auditing Committee.

The Congress Committee has this recommendation to make with regard to the balance in the treasury. We recommend that the sum of $447.78, which will be turned over to the association, shall be set aside as a fund to be used in the interests and for the purpose of establishing a dental journal, and that this shall be used for no other purpose without a majority vote of this association.

This completes the report of the Committee of Organization of the Fourth International Dental Congress, and we have only to say that we return to you who commissioned us as your representatives, our most hearty and sincere thanks for the manner in which you supported us in our work. We received from you our commission, and we now return it to you.

Motion was made and carried that the report of the Council be adopted.

Dr. James McManus, Hartford, Conn. I wish to offer the motion that

this association tender its sincere thanks to the Committee of Organization of the Fourth International Dental Congress for the very efficient and noble work they did during the holding of that congress.

The motion was carried.

The next order of business was the election of officers, and the selection of the time and place of meeting for the next annual session.

Dr. C. S. Butler moved that the time of the next meeting be set for the last Tuesday in the month of July.

The motion was carried.

Dr. Butler also moved that the next place of meeting be Minneapolis, Minn.

The motion was carried.

ELECTION OF OFFICERS.

The election of officers for the ensuing year resulted as follows:

President—A. H. Peck, Chicago, Ill.

Vice-president from the West—D. J. McMillen, Kansas City.

Vice-president from the East—George E. Hunt, Indianapolis.

Vice-president from the South—George S. Vann, Gadsden, Ala.

Corresponding Secretary—B. L. Thorpe, St. Louis, Mo.

Recording Secretary—C. S. Butler, Buffalo, N. Y.

Treasurer—A. R. Melendy, Knoxville, Tenn.

Executive Council—H. J. Burkhart, chairman; Charles McManus, B. Holly Smith, J. Y. Crawford, F. O. Hetrick.

Executive Committee—T. P. Hinman, V. H. Jackson, C. M. Work.

Dr. Carr moved that the officers of the sections and the other committees to be appointed be left in the hands of the Executive Council.

The motion was carried.

The general session then adjourned until Thursday morning.

THURSDAY—Fourth General Session.

The fourth general session was called to order Thursday, September 20, at 12 M., by the president, Dr. M. F. Finley.

The first order of business was the reading of the report of the Committee on Oral Hygiene, by Dr. J. P. Corley, Greensboro, Ala., as follows:

REPORT OF THE COMMITTEE ON ORAL HYGIENE.

Mr. President and Members of the National Dental Association,—The dental profession has universally accepted the fact that dental caries is possible only in the continued presence of decomposing organic matter. The source of immunity is, therefore, simple and definite. It is logical to suppose that a scientific profession would, in the light of this truth, adopt a system of prophylaxis; but has it done so?

The status of dentistry finds expression in the school, the journal, and the association. How many schools have a lectureship on hygiene and prophylaxis? Some of the more progressive provide a few lectures, but I know of none that require a special examination on this subject. The journals occasionally contain a good article on hygiene and prophylaxis, but when compared with the volume of reading matter which they present, preventive dentistry is in but scant evidence.

But, most important of all, that organization which should embody the very acme of dental scientific thought, the National Dental Association—composed as it is of the leaders in the profession, with no purpose save the service of their fellow men—spends at least nine-tenths of its time in the contemplation of the *cure* instead of the *prevention* of disease. And when we remember that the object of the association is to evolve the

highest order of service, we are amazed and chagrined.

The clinical feature of the association is a fairly accurate index to the clinical status of dentistry. If you will review the clinic of any dental society, from the dental congress down to the smallest local association, you will find that the burden of dental technique is cure instead of prevention. However, based upon the present conception of the etiology of dental caries, a school which does look toward prevention has come into prominence, but their method and watchword is extension instead of sanitation. It is more rational to eliminate the area of susceptibility by improving the toilet, than by cutting it out and replacing it with a filling material.

However, if the time required, the labor involved, the punishment inflicted, the mental, moral, and physical energy exercised in from one to a dozen extension restorations would not insure the adoption of a hygienic *régime*, then I agree that extension is not only justifiable but commendable. But the average patient can make extension anterior to the first molar unnecessary. It is remarkable that the men who attract the most attention, and who appropriate the most time are those who are most expert in handcraft and manipulative technique; while the man who teaches his patients to care for their teeth, thus keeping them healthy and sound, has no "beaten path to his door."

One of the most important discoveries developed by the study of hygiene is the fact that the perfect denture in normal use is practically self-cleansing; while, on the other hand, the imperfect denture is not only not self-cleansing, but it presents in addition serious difficulties to the maintenance of a sanitary state.

This fact has brought into conspicuous prominence the science of orthodontia. In fact, it stands by its own merit at the very "head of the river" in dento-surgical science. If we would insure immunity from dental ills, we must institute and maintain a state of consistent cleanliness, and in order to make this condition maintainable the denture must be complete, the arch symmetrical, the occlusion perfect, and mastication normal.

The next important system contemplated by the hygienist is the construction of all restorations—whether it be of crown contour or the entire crown, by crowning, bridge, or plate—as nearly self-cleansing as possible. Thus the banded crown is falling into disuse, and the gold crown is giving way to the inlay restoration. Unhygienic bridge and plate work, too, are condemned by the honest, intelligent dentist.

The third field opened up by the study of hygiene is the tremendous importance attributed to function. The part played by a grindable dietary and vigorous mastication upon the integrity as well as the environment of the teeth, is just beginning to receive due attention.

The medical world, too, is recognizing the profound systemic influence of wholesome, vigorous, enjoyable mastication; and, consequently, is compelling the food manufacturers to put grindable food upon the market. Wholesome, vigorous, enjoyable mastication without an efficient dental armature is difficult, therefore the greater need, from a systemic standpoint, of an efficient masticating apparatus.

We have evolved three systems of prophylactic treatment, which differ more in the method of application than in the treatment itself. Briefly, the treatment contemplates that every free surface of every tooth shall be perfectly clean and polished, and that this condition shall be consistently maintained. The patient is required to remove all organic matter before fermentation takes place, and also to keep all salivary deposits carefully brushed off the teeth and the gums massaged. The system does not assume, however, that the patient will be able to do this so perfectly that caries will be entirely prevented; therefore he is directed, even required, to make periodical visits to the dental office, where the sanitary work may be done by an expert assistant, who is denominated the "dental nurse." The man who has done the most to introduce and establish this system is Dr. M. L. Rhein of New York city.

The next school pleases to call its work the prophylaxis treatment, and differs from the one just mentioned mainly in that it proposes that the sanitary work shall be done by a regular practitioner of dentistry. The most pronounced advocate of this system is Dr. D. D. Smith of Philadelphia.

The third school undertakes to explain to the patient the merits of the prophylactic system, and the evils which result from its

non-observance. If he manifests sufficient interest to warrant his adoption of the system, he is instructed in the technique of the sanitary *régime*. He is then required to do all of the preliminary work of putting the mouth in a sanitary state. The dentist completes the operation, probably extending the procedure over several weeks' time, until the teeth are free from all deposits, pits, overhanging fillings, etc., and the patient has fully mastered the art of caring for the teeth. He is then dismissed with instructions to return when he becomes aware that his work is failing in efficiency. In cases where incorrectable asymmetries or excessive destruction of the gum and alveoli make it impossible for the patient to maintain a state of cleanliness, he must needs be referred to one of the two previously mentioned schools.

But of the forty thousand dentists practicing in the United States, only a small per cent. belong to any one of these three classes. During the past month I have examined patients hailing from thirteen states, from New York to New Mexico, and a conservative estimate would place the number of dentists who give any instruction in oral sanitation, or who require their patients to observe a prophylactic *régime*, at less than ten per cent. I have had opportunity to observe the methods practiced by the "lay" dentist, and my opinion is that the average dental practitioner does not know what a clean mouth looks like.

It is not uncommon to have a patient say that his dentist told him that the stains on his teeth were a protection, and should not be removed. It is still more common to hear him say that he has been warned against the too frequent use of abrasive powders, for fear of wearing the enamel off of the teeth; many laymen give the same reason as their excuse for not using the tooth-brush.

The subject of a popular treatise on oral hygiene has been before this body for several years. It offers many possibilities, but its accomplishment is attended with many difficulties. The treatise would deal extensively in details, and in this field there is such a diversity of opinion, even among recognized authorities, that the work must necessarily be done by one man. However, should a practical treatise be once published under the auspices of the National Dental Association, it would undoubtedly be accepted by a majority of the ethical practitioners of dentistry, both within and without the association, and would find no competitor in the field.

If the association adopts the President's suggestion that the sum of $250 be appropriated to defray the expense of publishing a first edition of one thousand copies to be distributed among the profession, giving one to each member of the National Association, and placing the rest in the hands of the state and local societies, with a subscription blank attached, it is possible that a sufficient number of sales could be secured to pay the expense of another and larger edition. There are thousands of patients who would gladly pay for such a work, and it would save the dentist many tedious hours of instruction.

I believe that a satisfactory work could be sold at twenty-five cents, provided the author gave his services without remuneration. I think that such a proposition would be forthcoming, especially if he were promised a small royalty on all editions after the first. The scheme is well worth the experiment, for it would at least open the way to something better.

The National Dental Association should exercise a paternal interest in every dental association and every dental practitioner in the United States. Whatsoever helps to shape the status of dentistry, whether it be the college, the examining board, or the society, comes within the association's legitimate field. The committees of the National should so direct their efforts that every dental organization in the country would be inspired to do better work.

The Committee on Oral Hygiene, in order to accomplish work of definite value, should have an auxiliary organization in every state society. These subcommittees should have immediate charge of the work in their several territories. They could apportion it out to local societies or to individuals, as opportunity and expediency suggested.

The central committee would study the question in a general way, make general rules and suggestions, and collect annual reports for data. The National Dental Association could in this way do a work of evangelization which would contribute more to the real science of dentistry than could be done through any other channel.

The *personnel* of this committee should be constituted of men of prominence who are practical and enthusiastic, willing to work without the fear of punishment or the hope of reward. The committee should be appointed from the members present before the adjournment of the meeting, so that they might hold a meeting before adjournment, for the purpose of organizing and planning the year's work. Each man could be assigned to some special feature of the program, thus relieving the chairman and secretary of the burden of the work, and at the same time accomplishing it in a more systematic and influential way.

The committee should be composed of men of broad-minded liberality, or else it would be impossible to arrive at any definite agreement as to the plan of action. This was abundantly demonstrated in the experience of the present administration. The work of the committee was effectually blocked by one man, who would neither suggest a plan nor agree to any plan suggested and indorsed by all the other members of the committee. Owing to a lack of unanimity the committee could undertake nothing as a body, consequently about the only work done was that for which the chairman assumed the responsibility.

The following circular letter was sent to all state associations, by the secretary, Dr. Stiff:

Mr. President and Members of the——— State Dental Association:

Inasmuch as the purpose of dental science is to put into operation the laws of oral hygiene, and remembering that many practitioners of dentistry, as well as the general public, are unversed in the science of prophylaxis, the chairman of the National Association's Committee on Oral Hygiene requests that each state association create a standing committee on oral hygiene, whose duty it shall be to promote the cause among the members of the profession, and through them to educate the public.

He desires, further, that these committees shall constitute a subcommittee to co-operate with the committee from the National, in an effort to establish the fact that oral hygiene is the very basis of dental protection.

Please notify me, through the secretary, Dr. Stiff, what action you may take in the matter.

J. P. Corley, *Chairman,*
Committee on Oral Hygiene, N.D.A.

The following letter was also sent to all state associations:

Mr. President and Members of the ——— State Dental Association:

I am requesting that your state examining board give a practical and theoretical examination on oral hygiene and dental prophylaxis. I am also requesting the dental colleges to put in a professorship, or at least a lectureship on the subject.

I desire that you shall pass resolutions indorsing the measure. Please notify me, through Dr. Stiff, the secretary of the committee, what action you may take in the matter.

J. P. Corley, *Chairman,*
Committee on Oral Hygiene, N.D.A.

The following letter was sent to the various state examining boards:

Universal recognition of prophylaxis as the highest expression of dental science impels the chairman of the National Dental Association's Committee on Oral Hygiene to request that the ——— State Dental Examining Board give a theoretical examination on the fundamental principles of oral hygiene and dental prophylaxis, and that each applicant for license, at the conclusion of his specimen clinic, be required to point out and describe the procedure necessary to put the patient's mouth in a thoroughly hygienic condition. Also, that he instruct, in your hearing, the patient in the best method of keeping the teeth and mouth in a healthful condition.

Please notify me, through the secretary, Dr. Stiff, what action you may take in the matter.

J. P. Corley, *Chairman,*
Committee on Oral Hygiene, N.D.A.

However, the matter was put into the hands of the secretary so late that action by most of the associations had to be deferred until next year. The Alabama association elected a committee and indorsed the request made to the examining board and colleges. Their committee is now at work canvassing the dentists of the state endeavoring to get the "rank and file" into line.

The chairman of your committee requested of the National Association of Dental Faculties and the National Association of Dental Examiners the privilege of presenting the matter suggested in the foregoing circular letters.

The National Association of Dental Faculties had such a full program that they were unable to entertain the request, but through

the good offices of Dr. Chase, a member of the committee and also a member of the National Association of Dental Examiners, the matter was presented to the Dental Examiners, who very kindly extended the courtesies of the floor to the chairman of your committee, and after an interesting discussion by a majority of the association, the following motion prevailed:

"RESOLVED, That it is the sense of the National Association of Dental Examiners that each state dental examining board include in its curriculum five questions on Oral Hygiene and Dental Prophylaxis."

After the adjournment of the National Association of Dental Examiners and the National Association of Dental Faculties, the conference committee of the Examiners Association presented the matter to the conference committee of the Faculties Association, who approved of their action and agreed to give the matter due attention. This is the most substantial encouragement which your committee has received.

The latitude and functions of this committee have never been discussed by the association. My closing request is that the matter be taken up and fully canvassed at this time, so that your next committee may plan their work with the conscious approval of the association.

Dr. H. J. BURKHART, chairman of the Executive Council, presented the report of the Committee on Journal, as follows:

REPORT OF THE COMMITTEE ON JOURNAL.

To the National Dental Association:

During the meeting of the National Dental Association at Asheville, N. C., in 1903, the suggestion was made that the National Dental Association should take over the *International Dental Journal*, free of all debt, with an assured position, with a list of subscribers and advertisers; and an expression of the stockholders of that journal present showed that all except Dr. Crouse were in favor of giving that journal to the National Dental Association.

A committee was appointed to consider the matter and report. The next year, 1904, being the International Dental Congress at St. Louis, there was no meeting of the National Dental Association and no report from this committee.

At the Buffalo meeting in 1905, the president in his annual address recommended that the *International Dental Journal* be taken over, and that a committee be appointed with power to act. The Committee on the President's Address recommended that the association should have a journal of its own, and a committee of three should be appointed to devise ways and means to this end. At the suggestion of Dr. Crouse the number was increased to five.

Dr. H. L. Wheeler then offered a resolution "That the report be adopted with the amendment as offered, and that a committee of five be appointed by the chair to consider ways and means to bring this about, and if necessary with power to act." This was carried. At the evening session of the same day the committee was appointed, consisting of Drs. C. O. Kimball, W. H. Potter, Herbert L. Wheeler, L. G. Noel, and E. MaWhinney. The last named not being a member of the National Dental Association, Dr. B. Holly Smith was appointed by Dr. Finley to fill the vacancy.

The Committee on the Journal, at the very moment of its appointment, found upon inquiry not enough funds in the treasury to warrant it in accepting the offer of any of the publishers who submitted figures for publishing the *International Journal*, the Lippincott prices being the highest of any, much greater than they had been receiving. Besides this, at the first session of the association, action had been taken shutting out various reputable and independent societies from membership in the National body, several of these societies being the ones that had pledged moral and financial support for the hoped-for independent journal. These were forced by the action of the National Dental Association itself to withdraw the offer of support they had so generously made.

The action of the National Dental Association—giving away their proceedings, and excluding the independent societies, and the low state of the treasury—made it absolutely impossible for the committee to secure either publishing material or financial support enough to warrant them in taking over or se-

curing by contract the *International Dental Journal.*

Meanwhile the board of directors of the *International Dental Journal* had taken action so as to legally turn that journal over to the National Dental Association in case their offer to give it to the association was accepted, but, finding that the proceedings of the National Dental Association for the year 1905 had been given away and their offer not promptly accepted, they decided to close up the affairs of the *International Dental Journal* and suspend its publication. Your committee endeavored to induce them (the board of publishers of the *International Dental Journal*) to keep the journal alive for another year, until the proceedings of the National Dental Association for the year 1906 would become available, and to give the time necessary to effect the change of ownership and management; and various members of the New York Institute of Stomatology, who were also on the board of directors of the *International Dental Journal,* endeavored by every means possible to persuade the magazine to continue another year, even promising substantial financial support. This was done in the hope that on second thought the National Dental Association might rescind its action of 1905 and again welcome members from reputable independent societies. All was of no avail. The board of directors of the *International Dental Journal* refused positively to continue publishing the journal for another year; so that it would cease in December 1905—unless at three weeks' notice your committee would undertake the whole management of the journal, finding editor, publisher, and advertising, without material from the association to publish or funds to draw upon.

Your committee believes that the offer of the *International Dental Journal* was a generous and useful one, but that it was made under such peremptory conditions as to make it practically impossible to accept it, unless the proceedings for the year had been placed at its disposal and a considerable sum of money set aside to meet necessary expenses connected with its management, and this done immediately, without thorough investigation or preparation for the transfer on the part of the association—which it seems to us was unreasonable.

Being unable to obtain a new lease of life for the *International Dental Journal,* various independent societies immediately took steps to organize some form of journal in which to publish their several proceedings, as they were unwilling to give the control of their proceedings to any journal controlled by and issued in the interests of a supply house.

Those societies have decided to publish their proceedings themselves, making the annual dues of each member cover his subscription and pay for the expenses of publication according to the number of pages of matter furnished by each society and the number of copies sent to members, the contribution of each society being controlled by its own editor, each society being responsible for its own utterances; the general management being vested in a committee from all societies.

Your committee knowing what was being done in this line, met in New York on December 5th, and after much discussion on the subject it was resolved to "defer action until we have the results of the attempt of the New York Institute of Stomatology and others to publish their own proceedings, in the hope that it will furnish us with new light upon the subject."

The first number of this new journal appeared in April, the intention being to publish it quarterly unless the National Dental Association should join in the enterprise, in which case it would be published oftener. The second number should have appeared in July, but owing to the necessity of the societies joining in the publication taking formal action to set apart funds for subscription to the journal for its members, in order to comply with the United States postal laws, that issue has been greatly delayed.

The cost of the new journal (including printing cover, binding, printing text, wrappers, directing, and mailing) is $1.80 per page for a quarterly publication of one thousand copies. Making of half-tone plates is extra. Printing illustrations, cost of glazed paper, etc., amounts to $1.57 per page. At this rate the cost of publishing the contents of the "Transactions of the National Dental Association for 1904 and 1905," in magazine form, would have been about $1000 or $1100. This does not include cost of editing the transactions, but on the other hand it provides for no advertisements, which would more than

meet the total expense. So that when the publication is fairly under way there should be left over a profit for the association.

Your committee, believing that it is desirable to make a beginning in this matter now, to that end recommends that arrangements be made with the societies publishing the above journal, to join with them in publishing its proceedings under the same conditions upon which they do.

And in order to conform to the postal regulations of the United States, we recommend that an alteration be made in the constitution by which part of the annual dues of each member be set aside to pay for his subscription to the journal (see action of the American Medical Association June 16, 1875), and if necessary that one or two dollars be added to the annual dues of this association to defray the cost of the journal, and that the Publication Committee be instructed to carry out these recommendations.

We also recommend that steps be taken to enlarge the National Dental Association by admitting upon equal terms all reputable practitioners of good standing in reputable societies, and to this end we recommend that a committee be appointed at this meeting to revise the Constitution and By-laws.

CHAS. O. KIMBALL,
HERBERT L. WHEELER,
B. HOLLY SMITH,
L. G. NOEL,
W. H. POTTER,
Committee.

The secretary, Dr. Peck, then read a letter from Dr. J. N. Crouse, Chicago, as follows:

CHICAGO, September 24, 1906.

National Dental Association, Atlanta, Ga.

Dear Sirs,—I am prevented being with you through a very serious accident to my wife in which her thigh was broken, and she is in too serious a condition for me to leave her. This, and the loss of my son in the early spring, are the two greatest calamities that have ever befallen me, and it makes me very sad. I have been a member of the National Dental Association for forty-one years, and have missed only one meeting before, and that was due to my own sickness. I mention this to show that I have always been an earnest attendant, and therefore to be deprived of this meeting is a great hardship to me. Give my best wishes to the association, and believe me

Yours very truly,
J. N. CROUSE.

P. S. Inclosed I send my check for my annual dues, which please hand to the treasurer.

Dr. CRAWFORD moved that the secretary be directed to send a communication to Dr. Crouse from the association, regretting his inability to be present at this meeting.

The motion was carried.

The next order of business was the report of the Committee on Army and Navy Dental Legislation, by Dr. WMS. DONNALLY, Washington, chairman, as follows:

REPORT OF THE COMMITTEE ON ARMY AND NAVY DENTAL LEGISLATION.

To the Officers and Members of the National Dental Association:

Your Committee on Army and Navy Dental Legislation deem it proper to present, in this its eighth annual report, the following brief sketch of the more important features of the work committed to it.

At the Omaha meeting, in 1898, on motion of Dr. C. S. Butler, a committee was appointed with instructions to investigate the questions pertaining to the establishment of an army and navy dental service, and to report at the next annual meeting.

Accordingly, an extensive and painstaking investigation of the subject, including the views of army officers and members of Congress, was made, the report of which, together with your action thereon, was printed in the Transactions for 1899. It appeared from this investigation and report that the magnitude and difficulties of an undertaking which had for its object the proper government recognition of the dental profession, and of the value and need of an army and navy dental service, were very much greater than anyone had imagined. Experience has shown that the difficulties have constantly increased, and that the opposition has become more

sharply defined. There were not only the difficulties of overcoming the lack of appreciation of the legislative and executive authorities, but there were the more serious matters of prejudice and influential opposition on the part of many of the medical and line officers of the army and navy, and on the part of senators and representatives, to any legislation that would lead to a new corps or a new class of commissioned officers. As an evidence of the increasing difficulties to be met, we cite the fact that the House Military Committee, principally through the influence of Representative W. P. Brownlow, by a vote of 8 to 5, in December 1898, recommended to the House a provision for one hundred army dentists with the rank of lieutenant, mounted; and that this same committee, on April 26, 1906, by exactly the same vote, that is 8 to 5, decided to consider and pass on the merits of the pending army dental bill (Senate 2355), and decided in an hour thereafter, by a still smaller majority, to make a report to the House recommending its passage. To many in the profession this will seem remarkable after all the intervening agitation of the subject, and the actual experience of the army and navy since that time.

From the time of its appointment your committee assumed that the question of first importance is the suitable government recognition of the dental profession, and therefore stated in its first report that—

"In regard to other aspects of the subject we as a profession have no responsibility, and we recommend that this association should limit its efforts to an attempt to secure a proper status for the army and navy dental surgeon, and his placement under conditions favorable to his highest degree of efficiency. This phase of the subject concerned your committee more than all else connected with it . . . . . because we could not believe that the dental profession would sanction the legalizing of an invidious distinction between the army surgeon and the dental specialist, knowing as we do that the unpleasant consequences would not be confined to the few under military environment, but would extend to and affect the civil status of the whole profession."

The report from which we quote and the President's address were submitted to a committee composed of Drs. James McManus, Thomas P. Hinman, and L. G. Noel, and in accordance with their recommendation the following was adopted:

"In reference to the report of Drs. Donnally and Finley, we do not entirely agree with them, that 'we should work for status only,' but recommend that this association work for the admission of dentists into the army and navy, and then for their status.

"We think that the above covers the report of Drs. Donnally and Finley, and recommend that they be thanked for their past services, and be continued on this committee."

At the following meeting (1900) your committee reported in part as follows (Transactions 1900, pp. 212, 213, and 214):

"In obedience to the letter and spirit of your instructions, your Committee on Army and Navy Dental Surgeon Legislation immediately began a most searching investigation of the conditions involved and the difficulties to be confronted in working out the problem assigned us.

"All the members of the committee at large to act in accord with the present one, and sundry other persons, were addressed personally or by mail with reference to the plan of work and the provisions of the bill to be proposed.

"In no other part of the work of this committee were there involved such apparently insurmountable difficulties as the drawing of a bill, the terms of which should be acceptable as a fair and reasonable basis for harmonizing the widely diverging views known to obtain among members of Congress, among officers of the medical and other departments of the army, and among members of the medical and dental professions.

"It was therefore to the success-hazarding terms and provisions of the bill itself (the bill since known as H. R. 972, and Senate 4044) that we, from the various viewpoints referred to, gave the most impartial study and thoughtful consideration of which we are capable, and it was with pleasure, and we trust pardonable pride, that we saw this most important feature of our work formally approved by the War Department, advocated by Surgeon-general George M. Sternberg and other prominent staff and line officers of the army; unanimously recommended by the House Military Committee; indorsed by a large majority of the members of Congress, and supported with more or less zeal by the representative members of our profession. . .

"The bill passed the Senate . . . . . and will have the same status at the opening of the next session of the present Congress."

In reference to the subject, President B. Holly Smith said in his address:

"It must be a source of much regret that the measure so ardently and ably urged by your committee for the appointment of dentists in the army and navy failed of passage. . . . . Let the fight be continued; with determined effort it must succeed. We urge the continuance of this committee . . . . on the army and navy dental legislation. . . . .

"In an informal and friendly conversation with Surgeon-general Sternberg, he said that he would prefer the men he appoints to be indorsed or recommended by this association. This is a gratuitous though very sensible expression of confidence in this body, and it might be appropriate to decide through what department such recommendation should be made; whether through the President, the Executive Committee, or the Executive Council, and if the latter, whether by individual or collective action."

The adopted report of the Committee on the President's Address, signed by Drs. C. N. Johnson, James McManus, and Thomas T. Moore, stated:

"We respectfully ask the association to carefully consider the question of the Surgeon-general's intimation that this association suggest candidates for appointment as examining dental surgeons under the proposed law, and the committee feels that the power to recommend resides with the Executive Council."

At the next meeting (1901) your committee, in its third annual report, announced the passage of the bill providing for thirty army dental surgeons, "under the terms and conditions applicable to army contract surgeons," and stated (Transactions 1901, p. 218) that—

"The transition of the corps from the contract to the commissioned status, under such restrictions as are suitable to protect the interests of the government and the honor of the profession, was provided for in advance. When the time comes for the dental profession to consider and determine its proper attitude with reference to promoting the legislation necessary to improve the status and the representative character of the army dental surgeon, there will probably be presented to your view new phases, factors, and personal interests, the influence of which will affect in different degrees the profession, the department, the Congress, and the friends of the selfishly interested."

There was also a well-defined and privately expressed sentiment in the House Military Committee, that the contract positions would soon be displaced by regular rank. While we have used the understanding thus reached in all proper ways, it is but just to the authorities referred to that we should say that there was not, so far as this committee was informed at the time, any promise of an unrestricted transfer of the contract *personnel* to commissioned rank. On the contrary, the wide variance in the standards with reference to age and physical requirements of the contract from the commissioned status was recognized by your committee and others in the profession, and by the Surgeon-general, as all but prohibitive of their unconditional transfer to positions of regular rank, and this aspect of the matter was discussed with the Surgeon-general, who seemed to entertain the idea that the "terms and conditions applicable to army contract surgeons" would still obtain as a restriction to the transfer of the contract *personnel* as a body, with the possible additional favor of a moderate extension of the age requirement to a very limited number. In order to remove as far as possible the probability of Congress disparaging on account of age the army contract dental surgeon's claim for rank, your committee several times suggested the advantage of the Surgeon-general's adopting the same standard of requirements for contract as for commissioned officers.

The effort to secure a change from the contract to the commissioned basis was, as stated, begun before the contract bill was enacted, and was renewed at the session of Congress immediately following the Contract Dental Surgeon Act of February 2, 1901, with both the executive and legislative branches of the government. Bills to that end were introduced in April 1902, one of which was indorsed by Surgeon-general Sternberg, April 29, 1902, and immediately thereafter vigorously and successfully antagonized, for the time being, by Secretary Root. It was therefore deemed expedient, your committee having the authority of the National Dental Association and the advice of influential members of the profession and of

Congress, to oppose all recommendations for the establishment of a contract dental corps for the navy. With the aid of that able statesman, noble man, and ever constant friend of the dental profession, Senator Edmund W. Pettus, the adoption of the contract system, as recommended by the Surgeon-general of the Navy, was successfully opposed by your committee before both the Navy Department and the Naval Committees of the Senate and House, and instead thereof a commissioned auxiliary dental corps to the Bureau of Medicine and Surgery was strongly and persistently urged. We had been led to believe, from several conferences with the then Surgeon-general of the Navy, that if we would refrain from any attempt to introduce into the then pending Navy *Personnel* Bill an amendment providing for commissioned navy dental surgeons, that the Bureau of Medicine and Surgery would recommend legislation providing for the introduction of dental surgeons into the navy, with the entrance grade of rank which the *Personnel* Act should provide for medical officers. But the first tangible result of the effort for a navy dental corps was a lengthy report, under date of January 29, 1902, signed by Secretary of the Navy John D. Long, on a dental bill offered by Senator Pettus. This report expressed the views of the Bureau of Medicine and Surgery as mildly favoring rank, and the more forcibly expressed views against rank by the Bureau of Navigation, which bureau has a general supervision over the navy *personnel.* Secretary Long's recommendation proposed a compromise between the views of the two bureaus, as may be seen from the following quotation:

"The contract system of employment of officers is, however, foreign to the naval practice, and its adoption in the case of dental surgeons is not deemed advisable, as some of these officers, if any be appointed, may be required to serve on board ships where, it is thought, all persons should be a part of the regular naval establishment."

—and from the accompanying recommendation, which was in brief that fifteen dentists for the naval service be examined, appointed, and removed "at the pleasure of the Secretary," and that they be rated as ensign without the right of promotion, with pay at $1500 per annum for the first five years; $2000 for the second five years, and a like increase each five years, until the pay reaches $3000 per annum.

This unique proposal for the appointment of dental officers was unsatisfactory, not in the matter of pay but in the social and official distinction from other staff corps officers, and was not favored by your committee, because the prospect then appeared quite favorable to the attainment, with the right of promotion, of the grade of rank in which medical officers enter the service; and for the further reason that the present Surgeon-general, who came at that time into the occupancy of this office, at once expressed his views in favor of the adoption of the army contract system of employing dental surgeons.

It was against the adoption by Congress of this latter view—the contract system for the navy—that we contended until March 2, 1904, when Secretary W. H. Moody, yielding to the appeals made through Dr. Eugene H. Smith, gave his personal attention to the subject, and in consequence sent to Congress, with the department's approval, a bill providing for the appointment of thirty dental surgeons with the rank and compensation of acting assistant surgeon—an actual rank created by an act of Congress in 1898, but which falls short of the regular rank in that it permits no promotion nor age retirement pay. This bill has been twice reported favorably by the House Naval Committee, and was approved and urged by your committee in the last months of the session ending March 4, 1905, with the understanding that the Surgeon-general would, by regulation, require of the navy dental surgeons the same standards that are required for regular commissions, and that he would recommend their unrestricted transfer in a short time to regular rank. The passage of this bill was also repeatedly and forcibly urged on Congress, without avail, by the Surgeon-general and the Secretary of the Navy.

Government departments are so given to following precedents, that the peculiarities and exigencies of the occasion for their establishment are often lost to view, especially when the precedent may be used to antagonize opposing influences, or to support the concurring views of a bureau chief. Hence it was convenient for the Surgeon-general of the

Navy to use the Army Contract Dental Surgeon Act in opposition to the grade of rank your committee insisted upon; but, to his credit, we are glad to say that he has repeatedly promised since 1902 to use his official influence for the adoption for the navy of the most favorable army dental corps bill we could obtain from Congress. It was in accordance with this understanding with him that, since April 1902, the army and navy bills have been made identical in the proposed grades of rank and corps organization, and for the same reason the earlier passage of the army dental bill was more urgently attempted. The adoption of either the army or the navy commissioned corps bills would immediately become a precedent for the adoption of the other. It has seemed several times quite probable that an agreement would soon be reached, by which substantially identical dental legislation would be adopted for the army and navy, but it was thought unwise to force the issue to the extent of compelling the opposition to openly and publicly avow its intent and to disclose its unknown strength, until finally, during the closing months of the fifty-eighth Congress and the first session of the fifty-ninth Congress, under the most favorable circumstances likely to be attained in many years to come, we forced, with all possible vigor and all the support that we could possibly command, a decision of the Senate in open session.

Senator Hale of Maine became the opponent of army and naval dental legislation when on February 6, 1906, he asked and obtained the consent of the Senate for the reconsideration of the medical and dental bills passed by the Senate the day before. He persisted in his unsupported opposition, with the success always possible under the rules of the Senate, until, on April 23d, Senator Pettus forced a final issue on the pending dental bill, by a motion for present consideration, against which there were seven votes, and against the motion for the passage of the bill, not a single vote. Senator Hale gracefully acknowledged his defeat, and in doing so paid tribute to "the venerable and distinguished senator from Alabama," and those back of him, in a manner we would commend to the few obstructionists in our own profession.

We quote briefly from page 508 of the Congressional Record:

"Mr. Hale. He has made himself in his service here agreeable in every way to senators, and there is nothing but the kindest feeling felt toward him by this great body. . . . . It is this feeling in regard to him and his desire to have this bill, which he has so much at heart, passed, which will carry it through. . . . . I think I have been bright enough to see from the beginning that this bill would go through. I have not done anything—I am sorry the senator thinks I have—to unduly prejudice the bill. While I am not in any way hopeful of defeating the bill, I do not think it ought to pass. I had a little experience in trying to stop another bill relating to the medical branch of the army, and I got no vote; I was good-natured about it and took my discipline and medicine as I shall now. I ran up against, not only the committee, but against the whole medical profession of the United States. I was beaten, badly beaten. Since then—it is no fault of the distinguished senator from Alabama—on this matter the dentists have been getting in their work, and I have letters, as other senators have, from my state, from men whom I regard very highly, writing to me and imploring me to vote for the bill the senator from Alabama has in charge. That I cannot do, because it is an innovation. I realize that all I could do now would be unavailing. I think, in advance, I may congratulate the senator from Alabama that he has got the Senate behind him, so I am not inclined to take any more time or stand any further in the way of the senator from Alabama."

This bill (Senate 2355) was then amended, as will be shown later, and passed the Senate without an opposing vote.

Senator Hale is the chairman of the Committee on Naval Affairs, and in this position exercises a supervision and control over navy legislation to an extent perhaps never attempted by anyone else; hence his public contention against an army dental corps may be repeated with more success against the navy dental bill. He has, however, been able so far to prevent the dental bills recommended by two Surgeons-general and three Secretaries of the Navy, and supported by those acting with your committee, from reaching the stage in legislative procedures where an open and fair fight is possible. In other words, no navy bill has been permitted to come to a vote by the Senate Naval Committee or by the Senate, and no special attention has been openly called in Congress to the evidences offered by the Navy Department and your com-

mittee, as to the need and value of a navy dental service. The House navy dental bill, like the Senate army dental bill, retains its place on the House calendar until March 4, 1907, unless sooner disposed of, and may be enacted as a separate bill or attached as an amendment to another subject of legislation to which it is germane. If the army dental bill becomes law before the navy dental bill is acted upon, its terms may probably be adopted substantially as the terms of a navy dental bill. In case of failure to secure for navy dental surgeons any grade of regular commissioned rank, we should continue to insist, as your committee has done heretofore, on at least the same standard of requirements provided by law and regulations for commissioned officers, in order that disparity in standards may not be used later as a bar to their transfer to regular rank. The lack of any legislation authorizing a naval dental service has resulted in the Navy department assuming the right to make special contracts with dental surgeons, and with men claiming a knowledge of dentistry, by which they are rated as hospital stewards and assigned, without a test of their qualifications, to the performance of the function of the dental surgeon. These men are practicing in violation of the laws of the states where they are located, because the fact that they are on government ground does not exempt them from the penalties of the law of the state, which retains its police power over the lands ceded to the government. The Navy department by this unauthorized use of public funds appropriated for other purposes perpetuates an inexcusable practice which Congress has stamped with its disapproval. It also dishonors the dental profession and the colleges and the universities which have dental departments, by grading dentistry so low and rating dentists to positions below that which a professional man should accept. But worse than all else in its effects is the assignment of incompetent and mercenary men whose practice is often harmful, sometimes maiming for life, proof of which may be found in the cases of young apprentice boys who were thus rendered unfit for re-enlistment and made pensionable for life from an early age.

Surely the condition in the navy with reference to the need of a competent dental service is a matter of more serious consequence to the government, to the navy *personnel*, and to the dental profession, for reasons economic, humane, and ethical, than the conditions which exist in the army.

In reference to the means and methods used in the promotion of the army and navy dental legislation, we desire to say that they were of the kind universally regarded as convenient and acceptable to the authorities, and that at all times the honor, dignity, and good name of the profession was safeguarded by discreet and proper conduct on the part of the profession's *authorized* representatives. Your committee commanded the respect and confidence of the authorities, as shown by results, and its course was comparable to that of the civilian committees of medical and church organizations whose efforts were acceptable to the authorities and to the surgeons and chaplains who are the beneficiaries.

It is impossible to recite in their chronological order the events in the history of army and navy dental legislation and at the same time connect them in their proper relation.

We will therefore confine the further statements of this report to the interpretation of the terms of the several bills; the elucidation of the recommendations and modifications thereof made by War department officials; to the legislative procedures through which the bills reach the final act in their passage; and to the objects, methods, and results of the work of your committee with more especial reference to the terms, the provisions, and the legislative course of the original and the amended army dental bill fathered by Senator Pettus, known as Senate 2355. The objects have been clearly stated and often published and approved. However, they may be briefly repeated here:

Transactions 1902, p. 273:

"*First.* That there may be secured to the officers, men, and boys in the U. S. military service the benefit of the services of educated, ethical, and efficient corps of dental surgeons.

"*Second.* That the value of dentistry to the general health, comfort, longevity and efficiency of the military man may be more universally recognized.

"*Third.* That the educational value of the dental college course, the importance of the function of the Doctor of Dental Surgery, and the civil status of the dental profession, should be conceded as sufficient to entitle the

military dental surgeon to equality with other professions in certain grades of rank, pay, and allowances."

From Senate Naval Committee hearing, March 11, 1902:

"The proposed bill is a mild and most respectful protest against the government, or a department thereof, in the absence of legislative authority, giving a military status to a profession wholly inconsistent with its civil status and in no respect commensurate with the importance and value of the service demanded, nor with the standard of educational equipment fixed by the profession and measured up to by its educational institutions."

From a letter to the profession, dated December 28, 1905:

"Remember, the object committed to us is not merely for the benefit of a few individuals, but is for the protection of the dignity and high civil status of American dentistry at home and abroad, and for the comfort, health, and efficiency of our country's defenders on land and sea."

No other object has ever been stated in the Transactions of the National Dental Association, nor in any published or private utterances of your committee, save the one of incidental, impartial, and equal interest in the thirty army contract dental surgeons and the regard shown for the equity of their claims on the government, as a body whose service should command consideration and favor over other applicants for commissioned rank in the army dental service.

All the several bills offered by your committee from April 1902 to January 26, 1905, were substantially identical. The bills approved by Surgeon-general Sternberg in April 1902, and disapproved by Surgeon-general O'Reilly in April 1904, were identical. They provided for one dental surgeon to one thousand army men; for corps organization; for three grades of rank with the advantages the same grades afford medical officers; for a standard entrance qualification; and for the equal eligibility to appointment of the contract dental surgeons to three captaincies and twenty-seven lieutenancies. None of the minor details appearing in Senate 2355 were introduced, because they were not demanded by Surgeon-general Sternberg, as they have been by Surgeon-general O'Reilly, and because the Military Committees did not then scrutinize the bill with the care they give when preparing a report of their approval of a bill. The War department declined making report on dental bills offered after April 1902, and the Military Committees refrained from consideration of these bills because they were not reported on by the War department. Your committee, with a view of creating a sentiment in favor of the bills, used all the support at its command with both the War department and the Military Committees, until finally we induced these committees to make simultaneous special requests for a report on H. R. 79, and on the corresponding Senate bill. In response to the request of the Military Committees for a report, H. R. 79 was reported upon unfavorably by the Surgeon-general under date of April 15, 1904, and unfavorably by the general staff (a body composed of about thirty selected army officers), unfavorably by the chief of staff, General Chaffee, unfavorably by Secretary Taft, and returned to the Senate and House Military Committees. We omit this report as, for obvious reasons, we have always avoided any publication of it.

At the same time the Surgeon-general, in accord with an agreement with Dr. Finley to favor the essential for which we contended, made certain recommendations, and with no official encouragement other than this insufficient concession your committee, undaunted, began at once negotiations with a view of reaching an agreement whereby the Surgeon-general would, at a later suitable time, affirm his approval of every detail of the terms of a bill to be drawn and presented to Congress by your committee, the provisions of which were to be along the lines of his recommendations of April 15, 1904, but the terms to be more favorable in several respects, especially with reference to the special recognition to be accorded those already in the contract service. It would be impossible to give in detail the propositions, pro and con., and the views expressed in the negotiations, but the formal views expressed to the general staff by the Surgeon-general, and the result of the negotiations for their modification are herein set forth for whatever present or future value they may have to dentistry:

"Office of the Surgeon-general,
"Washington, April 15, 1904.

"To the Chief of Staff, U. S. Army.

"*Sir,*—In considering the bill (H. R. 79) organizing a dental corps composed of officers of various grades and with military rank, this office has hitherto taken the position that rank was not needed to further the proper performance of the duty devolving on a dental surgeon whose functions are strictly limited to the care, etc., of the teeth of officers and enlisted men of the army. Assurances are, however, given from credible and responsible sources that the possession of rank would result in giving better service than can be procured under the present contract system. This being the case, I have the honor to recommend that a bill be drawn to accomplish this purpose, and that it be submitted to Congress for legislative action. The bills referred to—which are now in committee—are defective and should not pass.

"In my opinion, the bill to be proposed should contain provisions to the following effect:

"(1) Prescribing age limit and professional qualifications.

"(2) Providing examining boards to determine physical fitness (a board of medical officers), and a dental board (to consist of one dental surgeon now in the military service, to be designated by the Secretary of War, and two dental surgeons nominated to the Secretary of War by the president of the American Dental Association, who while so serving should be properly compensated), and without the recommendation of these two boards no one shall be appointed.

"(3) No more than five original appointments shall have the same date of commission. On being commissioned they shall be entitled Dental Surgeons and shall rank as First Lieutenants. After five years' service, those holding this grade who shall have passed a satisfactory physical and professional examination shall rank as Captain, and after an additional ten years' service, shall, subject to a similar examination, rank as Major. The pay and allowance of dental surgeons shall be the same as those of first lieutenants. But their right to command should be absolutely limited to the dental surgeons and such enlisted men as may be detailed for duty with them, so as to prevent them from assuming command of hospitals.

"(4) The whole number of dental surgeons should not exceed thirty, of whom three shall have the rank of major, five the rank of captain, and twenty-two the rank of first lieutenant.

"The petition from the Odontological Society, Cincinnati, Ohio, addressed to the Secretary of War, is herewith returned.

Very respectfully,
(Signed) "R. M. O'Reilly,
"Surgeon-general U. S. Army."

By the above you will see that the Surgeon-general first yielded to "assurances from credible and responsible sources" as to rank, but disapproved the other features of the bill, and offered no concessions in the line of a clause for which we had for years contended, namely, that contract dental surgeons should be eligible (without regard to age requirement or any condition other than the constitutional prerogative of the appointing power), three of them to the rank of captain and the others to the rank of lieutenant.

The Surgeon-general having in this recommendation yielded to our claims only as to the one of rank, we continued informal negotiations with him, the next result of which was shown in the formal official indorsement under date of December 17, 1904, of the following:

H. R. Military Committee hearing on H. R. 79, January 26, 1905:

"*Provided,* That the dental surgeons attached to the Medical Department of the Army at the time of the passage of this act who have rendered satisfactory service for three or more years and who passed the required physical and professional examinations and were within the age limits required by regulations at the time their original contracts were signed, may be eligible for appointment, two of them to the rank of captain and the others to the rank of first lieutenant, in the dental corps, provided that before being commissioned they shall pass the physical examination required by regulations of other candidates for commission in the army."

By this clause you will observe that the over-aged and those who had not at entrance passed the required physical and professional examination were disqualified, while those who within the age limit and had stood the entrance examination had to stand another examination.

However, there was an actual concession to the contract men in this clause, which through interchanges with the Surgeon-general, was extended to all the contract dental surgeons without regard to age, and required examinations only of those who had not passed any part of the required examina-

tion. This very great concession as to age and unusual concession as to examinations has no precedent nor parallel in liberality to contract or regular medical officers. It is expressed in the bill as follows:

"*Provided*, That dental surgeons attached to the Medical Department of the Army at the time of the passage of this act may be eligible to appointment, three of them to the rank of captain and the others to the rank of first lieutenant, on the recommendation of the Surgeon-general and subject to the usual physical and professional examinations herein prescribed: *Provided*, That the professional examination may be waived in the case of dental surgeons whose efficiency reports and entrance examinations are satisfactory to the Surgeon-general; and the time served as dental surgeons under the act of February 2, 1901, shall be reckoned in computing the increased service pay of such as are appointed under this act."

The important concessions, or improvements, over the several official recommendations, appear in their order in the bill as follows:

(1) A distinct provision for "a corps of dental surgeons" instead of rank for individual dental surgeons.

(2) One dental surgeon to 1000 officers and enlisted men instead of thirty dental surgeons in all.

(3) The standard age and other entrance requirements are provided for original appointees only, instead of for all, including those in the contract service.

(4) The exemption, at the option of the Surgeon-general, of contract dental surgeons from all the standard regulation requirements which contract surgeons have to meet to obtain rank.

(5) Reckoning the time served in contract positions in computing pay, which increases their pay 10 per cent. at once, instead of after five years from date of commissions.

(6) Placing dental surgeons as to pay, allowances, and to the promotions allowed them, on a par with surgeons, which makes them mounted instead of infantry officers and gives each of them $100 to $200 a year more pay.

(7) Creating three captaincies at once instead of this rank being earned by five years' service as lieutenant.

(8) Making captains eligible to the rank of major after ten years' service instead of after ten years' "additional" service as lieutenants.

(9) Making the full number of majors equal one-eighth of the whole, instead of three majors in all.

(10) Changing the Surgeon-general's recommendation that two civilian examiners be "nominated to the Secretary of War by the president of the American Dental Association" to the certification of their qualification by the Executive Council of the National Dental Association, thus changing the "nomination" by one man to "certification" of qualification by a council of several men, and changing the appointing power from a political officer to a medical officer.

With these valuable concessions, unselfishly claimed in the name and for the benefit of the dental profession and granted because your committee made the claim nonpersonal, they were stated in the form of a draft of a bill, with the understanding with the Surgeon-general that he would ask no less and we would ask no more, we formally submitted the draft of Senate 2355 to the Senate and House Military Committees, January 26, 1905.

The Senate Committee authorized a subcommittee to report it during the closing months of the 1904-05 session of the fifty-eighth Congress, but the subcommittee declined to report it to the Senate, and our House Military Committee friends, though favoring the bill, doubted the expediency of forcing a final decision by the House Military Committee, and also, for peculiar reasons, questioned the policy of reporting the bill at that session even though a favorable report should be ordered by the committee.

With the opening of the next session the bills (Senate 2355 and H. R. 9737, fifty-ninth Congress) were urged with the same vigor and earnestness exhibited by your committee and its active supporters during previous years of its existence. By concerted effort, strong influences were brought to bear on the Military Committees, on the War department, and on the President. The modified Senate 2355 was sent to the War department again with a special request of the Senate Military Committee for the views of the military authorities, in the hope that the new staff officers and the Secretary would report more

favorable views, but in this we were disappointed, all again reporting adversely except the Surgeon-general, who reported, under date of January 19, 1906:

"Respectfully returned to the Honorable the Secretary of War, inviting attention to the inclosed copy of my letter of April 15, 1904, addressed to the chief of staff, in which the organization of a dental corps on the lines suggested by this bill was recommended.

(Signed) "R. M. O'Reilly,
"*Surgeon-general U. S. Army.*"

Notwithstanding the adverse views of the general staff, the new chief of staff, and the Secretary of War, the bill was strongly supported by the Senate Committee, which without a dissenting vote ordered a favorable report.

It was reported to the Senate February 1st, and passed the Senate February 5th, and at the request of Senator Hale its passage was reconsidered February 6th, from which time repeated futile efforts were made to call it up by unanimous consent for passage, until April 23d, when on motion of Senator Pettus it was called from the calendar and passed, Senator Hale acknowledging, as hereinbefore stated, the futility of further opposition.

At the time of its passage, and through unwise influences, a member of the Military Committee successfully introduced an amendment striking out the examining board organization clause providing for one army dental surgeon and for two civilians whose qualifications are certified by your Executive Council, which clause was strongly urged by the Surgeon-general and approved by both the Senate and House Committees as a wise and economic measure, and was supported by your representatives as a fitting recognition of the National Dental Association, through whose influence and effort, and at whose expense both the existing and the pending army dental surgeon laws have been successfully promoted.

In its place was substituted a provision whereby an *army surgeon*, with two army dental surgeons, would conduct the examinations in *practical dentistry and the usual subjects of a dental college course*—a substitute that would make it impossible for the Surgeon-general to exercise a prevised opportunity to meet an occasion possible under any constitutional bill, namely, to retain in the service as civilian examiners any one or two contract dental surgeons who, from unavoidable cause, might fail to qualify for rank.

Though this substitute was stricken out and was replaced with the original by the House Military Committee three days later, it was a most unfortunate occurrence, affecting a delicate and complicated situation at a critical moment and in all probability imperiling the fate of any form of army and navy dental legislation, while it certainly imperils the passing of Senate 2355 without the age amendment proposed by the House Military Committee. By this interference with the Surgeon-general and your committee we have lost irretrievably a parliamentary advantage and a degree of interest and zeal on the part of the profession's most influential friends. All legislation is a compromise, and all right-thinking members of the dental profession were bound by the interests at stake, and by professional amenities, to regard with sacred honor the compromise attained with great difficulty by your authorized representatives, more especially as it not only involved a gratifying recognition of the dental profession but safeguarded the equities of the unrecognized claims of every individual in the contract service to an extent unprecedented in army and navy legislation.

The Senate bill, amended, went to the House and was referred to its Military Committee April 25th, and through the efforts of your committee a meeting of that committee was called on April 26th especially for the consideration of the amended bill, and between these two dates every member of the Military Committee was again, as many times before, approached informally in behalf of the bill, either verbally or by telegraph or long-distance 'phone, by either your committeemen, their fellow congressmen, their friends at home, or otherwise. It was also arranged to have present at the opening of the Military Committee meeting several influential friends of the cause, including a member of the Senate and the Surgeon-general. After a very brief "hearing" the House Military Committee went into executive session and thereat the Senate bill was amended, as requested by the Surgeon-general and your representatives, by restoring the examining board section; and

on the initiative of members of the Military Committee, by limiting the whole number of dental surgeons, not to exceed forty-five, by limiting the age requirement of contract dental surgeons to thirty years at the time their original contracts were signed, and by requiring of other appointees a year's probationary service under contract before being commissioned.

Three of these amendments are immaterial to the essential objects sought by the profession, but the age limit, unless modified or counteracted in some way by a new amendment, would seriously and sadly affect seven members of the contract corps whose ages are above the standard, and at entrance were approximately as follows: 54½, 37¼, 37, 33½, 33, 31, and 30½ years.

As it is the strongly supported policy of the executive and legislative branches of the government to oppose the regular commissioned rank for new corps or classes of officers; to oppose the regular commissioned rank for any person who is not within the standard age and the physical and professional requirements of his respective class; and as the regular commissioned rank is denied by law and the pending medical bill to the army contract surgeon, all because of the increasing sentiment against swelling the retired list (which now costs the government about seven millions a year), you must see that the age question unfortunately raised must not only make its elimination in this case next to, if not altogether, impossible, but that to make the passage of a commissioned dental corps bill dependent on the unconditional removal of the age limit would nullify the present and future influence of the profession with Congress and with the higher executive authorities because of the unreasonableness and untenableness of such an attitude.

The army and navy dental bills are public measures. and it would be only by the most accidental combination of circumstances that Congress would in such bills favor contract dental surgeons to the extent of establishing a precedent by going far beyond the favors granted other men similarly situated in relation to the army or navy.

We cite, for your information, the reasoning, substantially as uttered, of a member of the House Military Committee to whom appeals were made especially in behalf of a contract dental surgeon who is now approximately sixty years of age:

"We are asked to grant for the first five years' service, for which he has been paid about $1000 a year more than is allowed commissioned officers, and for the next four years' service at the regular pay, plus 10 per cent. and the usual allowances, nine years' service in all, to grant the retired pay of a major for probably twenty or more years, or extra pay estimated at approximately $40,000 more than the usual pay for nine years' service, whereas the comparatively few officers who, by our policy, are retired for age *earn retired pay by forty-two to forty-four years' service.*"

The extra pay in this one case could not be estimated at much, if any, less than $30,000.

To the men of our profession who give ear to criticisms reflecting on the result of your committee's work we make the plea that they ask each critic what he has done in a nonpersonal way to help your committee overcome the reasoning above cited, and how many congressmen he has personally convinced that the reasoning cited is wrong and that Congress is doing an "injustice" in declining to thus use the people's money; and you who want to know what your committee has to meet, would do well to ask your congressman to what extent sentiment will avail to overcome in Congress the cold, economic reasons for keeping guard over a rapidly growing retired list.

To continue the recital of facts, your committee began, immediately the executive session of the Military Committee ended, to secure an extension of the age limit amendment, or at least the opportunity for all in the contract service to retain positions at equal or better pay. The prospect of success was at first discouraging, though from the 6th to the 25th of May, the Surgeon-general and members of the profession co-operating with your committee, we were encouraged. It was later ascertained, however, that on further consideration of more recent representations made to the members of the Military Committees by members of Congress and in interviews and in letters by members of the dental profession, there had been quite a reaction in the views of some of our best friends in Congress, and we are therefore obliged to report

that, in our judgment, it is impossible to secure a total elimination of the age amendment so that all the seven over age could be made eligible for regular rank; and further, that it is highly improbable that there could be secured an amendment whereby a part of the seven over-aged could be made eligible to regular rank and the remaining part provided with positions satisfactory to them.

It is, however, quite possible, if there be unanimity in the profession and in the dental corps, to treat all the seven over-aged alike, or as a class, and provide, by amendment to Senate 2355, for their retention in the service with at least their present pay or with their present pay and the rank the pending army medical bill provides for the contract surgeon. In such an event there would doubtless come in a few years the opportunity to place all the remaining seven over-aged, with possibly one or two exceptions, in grades of regular rank equal to that they would attain if now made eligible to regular rank under the pending bill. This latter, it is understood, is quite acceptable to some of the personally concerned contract surgeons.

Having recited this rather lengthy history, and given our judgment of the possibilities of the present legislative situation, we respectfully recommit the matter of army and navy dental legislation to you, the source of our authority, for such instruction or other action as you deem wise and proper.

We cannot refrain from using this opportunity to express our profound regard and gratitude to the profession's noble friends in Congress, in the army and the navy service, in the medical and the dental professions, and in high educational positions, for their indispensable co-operation and philanthropic service in this cause of the dental profession.

Respectfully submitted.

Your faithful servants,

Wms. Donnally, *Chairman*,
Thomas T. Moore,
J. W. David,
J. E. Hinkins,
G. W. Boynton,
William D. Monroe,
Gordon White,
Committee.

Dr. Crawford. In view of the very great importance of this question, and in view of the limited time in which we have to consider it, and the great danger of moving somewhat precipitately, I make a motion that we extend to the chairman and to the members of the committee our sincere thanks for the constant and vigorous efforts that they have made along the line of legislation pertaining to the question of dental surgeons in the army and navy, and that a committee of five be appointed to act in conjunction with the President and Executive Council to control the matter of legislation.

The motion was carried.

Motion to adjourn was then made and carried.

THURSDAY—Fifth General Session.

The fifth general session was called to order Thursday evening, September 20th, at 8 o'clock, by the president, Dr. M. F. Finley.

The first order of business was the report of the Executive Council by Dr. A. H. Peck, secretary. The report included correspondence and resolutions passed in the Executive Council, as follows:

Atlanta, Ga., September 21, 1906.

Hon. E. W. Pettus, U. S. Senate, Selma, Ala.:

Dear Sir.—The National Dental Association is now in session in this city—the very

atmosphere is surcharged with enthusiasm. Dr. Williams Donnally, that noble and tireless representative of this association in legislative matters in Washington, feelingly tells us of the interest you have manifested in our great cause—the advancement of our profession—by your interest in legislation.

Therefore, we, dentists of Alabama, beg to express to you our congratulations and sincere appreciation of your generous, just, and able espousal of our cause.

Most respectfully,

[Signed by twenty-six Alabama dentists—see page 38.]

ATLANTA, GA., September 20, 1906.

To the Executive Council, N. D. A.

Gentlemen,—In the judgment of your Executive Committee, the work of Dr. Wms. Donnally, as chief promoter of all bills relating to dental corps in both departments of the service, has been conducted with an unselfish desire for the best interests of dentistry and for the well-being of those at present in the army corps.

Respectfully submitted,

J. D. PATTERSON, *Chairman.*
C. S. BUTLER, *Sec'y.*

Resolutions.

RESOLVED, That the sum of $200 be appropriated to reimburse Dr. Donnally for whatever money he may have expended in Washington in the interests of dental legislation in reference to the army and navy of the United States; and

RESOLVED, That a vote of thanks be extended to Dr. Donnally and the other members of his committee for their untiring efforts; and

RESOLVED, That the Legislative Committee when appointed shall consist of five members; and

RESOLVED, That all matters of army and navy legislation shall be under the direction of the Executive Council.

On behalf of the Jamestown Exposition Dr. Thorpe requested a provisional loan of five hundred dollars. After some discussion the Council by vote recommended that if after a time the funds in the treasury permit, one, two, or three hundred dollars, according to which amount can be spared, be donated to the Jamestown Congress, with the proviso that the amount shall be refunded by said congress, should the funds of the latter permit.

On motion the report was adopted.

The report of the Committee on Necrology was next presented, embracing obituary notices and appropriate resolutions referring to the decease of Drs. Chas. C. Chittenden of Madison, Wis., John A. Chapple of Atlanta, Ga., and Chas. W. Stainton of Buffalo, N. Y., as follows:

REPORT OF THE COMMITTEE ON NECROLOGY.

It is with a keen sense of duty and regret that your Committee on Necrology are called upon to record the death during the past year of three prominent and valued members of this association—men who were endeared to us by their many enviable characteristics and whose memory we do well to cherish.

Charles C. Chittenden.

Dr. Charles C. Chittenden, Madison, Wis. Died December 15, 1905. He was born in Nunda, Livingston county, N. Y., May 10, 1842. In 1855 he moved to Madison and began the study of dentistry under the guidance of his father, a practitioner of unusual skill and superior ability. Dr. Chittenden entered the ranks of the profession as an active member in 1863, in partnership with his father, which association continued until the latter's death in 1875. He then practiced alone until 1895, when he formed a partnership with Dr. Wm. H. Mueller which continued until his death. Dr. Chittenden was a man of rare personal and professional attainments, which were publicly recognized in state and national organizations. In 1885, when the Wisconsin State Board of Dental Examiners was created, he was appointed a member of that body, and with the exception of two years he served continuously as its president. He was president of the Madison Odontological Society, and he served as president and as chairman of the committee on colleges of the National Association of Dental Ex-

aminers. The last honor which came to him was the presidency of the National Dental Association for the session of 1903–04. His incumbency of the latter office embraced the period of the holding of the Fourth International Dental Congress at St. Louis, when his rare attainments and personal dignity won for him the plaudits of the large delegation from the old world in attendance, as also of his fellow countrymen.

Resolution.

RESOLVED, That in the death of Dr. Chittenden this association has lost one of its most earnest and honored members, one whose life was unselfishly devoted to his profession, and whose removal we sincerely mourn.

John A. Chapple.

Dr. John A. Chapple, Atlanta, Ga. Died May 16, 1906. Dr. Chapple was born at Greensboro, Ga., October 23, 1854. In 1872 he began the practice of dentistry in La Grange, Ga., and removed to Atlanta in 1891; there he continued in active practice until his death. He was a valued member of the faculty of the Atlanta Dental College, and a teacher of rare ability and attainments, which is amply attested by the universal expressions of sincere love and devotion of the students who were so fortunate as to be under his guidance and instruction. For his *confrères* he always had a kindly welcome. Active in professional associations, where his convictions found forceful expression, he commanded close attention, but never trespassed beyond the realm of kindliness. His social gifts were seeming inspirations.

Resolution.

RESOLVED, That in the death of Dr. Chapple this association records the loss of one of its most valued members, and one whose qualifications endeared him to every member.

Charles W. Stainton.

Dr. Charles W. Stainton, Buffalo, N. Y. Died June 6, 1906, in the sixty-eighth year of his age. Dr. Stainton was of English descent; his parents came to this country from England about 1819, and were among the early settlers of Wyoming county, New York. In October 1864 he entered a dental office for instruction, and in January 1866 he opened an office practice. In 1870–71 he matriculated in the medical department of the University of Buffalo, where he attended a course of lectures. The following winter he spent at the Pennsylvania College of Dental Surgery, and was graduated from that institution in March 1872. In October of the same year he removed to Buffalo, where he continued in the active practice of dentistry until his death. Dr. Stainton was a member of the Dental Association of Western New York, the Eighth District Dental Society, serving as president, and in 1879 its treasurer, serving in that capacity for twenty years. By a clause in his will he bequeathed his entire library to the Eighth District Society. He was a member of the Buffalo Dental Association, serving as president, and afterward became treasurer of the same organization and held the position for fourteen years. He served for forty-one years the several bodies with which he was affiliated in the capacity of treasurer, and was treasurer of the Dental Society of the State of New York at the time of his death. As an active, consistent member of this body he was always deeply interested in its proceedings. In debate he was especially strong, fearless, and resolute against measures in which he detected any error in principle or idea. Dr. Stainton was a true friend, liberal, unselfish, and sincere. He was a devoted member of the Methodist Episcopal Church, and deeply interested in all charitable work.

Resolutions.

RESOLVED, That in the demise of Dr. Charles W. Stainton this association mourns the loss of an earnest, upright, and beloved member. His passing away leaves a vacancy not easily filled, and is sincerely mourned by all who knew him.

RESOLVED, That this brief history and resolutions be inscribed upon our records, and a copy be sent to the families of each of the deceased.

E. S. GAYLORD,
WM. JARVIE,
H. B. MCFADDEN,
W. P. DICKINSON,
L. P. DOTTERER,
Committee.

On motion the report and resolutions were adopted.

The report of the Credentials Committee being called for, Dr. COGAN moved that the report of the Credentials Committee be referred to the Committee on Publication. (See page 39.)

The motion was carried.

Dr. C. S. BUTLER moved that as there was no member of the Committee on the President's Address present to make a report, the report be referred to the Publication Committee.

The motion was carried.

The report as subsequently handed to that committee here follows:

REPORT OF THE COMMITTEE ON THE PRESIDENT'S ADDRESS.

Mr. President and Gentlemen:

Your committee desires to congratulate the association upon the able character of the President's address. It exhibits a watchful interest in the welfare of the association and the profession generally.

We respectfully report the following recommendations:

(1) We recommend the appointment of a committee to assist in the revision of the U. S. Pharmacopeia that may confer with Dr. H. C. Wood and request representation.

(2) We recommend the concurrence of this body in the action of its officers in incorporating the National Dental Association.

(3) We also recommend the approval by this body of the action of its officers in contributing $250 to the San Francisco Dental Relief Fund.

(4) We recommend the appointment of a committee to secure the passage of a law appointing a dental assistant curator for the Army Medical Museum and Library, who shall be a dentist.

(5) We approve the suggestion of employing someone to devote his entire time to research work, but your committee does not feel that the funds of the association would warrant any appropriation at the present time.

(6) We heartily recommend the suggestion of the president to support the efforts of the Committee on History. Every member of this association should subscribe to Dr. Guerini's work.

(7) Action having been taken by the Executive Council in regard to the publication of a journal by this body, no further recommendation is necessary on the part of your committee.

(8) The section work as carried out at this meeting has been so satisfactory that we heartily concur in the recommendation of the president, and suggest the continuation of the present plan until the membership has so increased as to make a change necessary.

(9) We suggest the adoption of a rule requiring all essayists to furnish a synopsis of their papers in time for the appearance of the same in the program issued prior to each meeting.

(Signed) B. HOLLY SMITH, *Ch'man*,
JNO. I. HART,
R. M. SANGER,
Committee.

Dr. BUTLER. I have here a paper prepared for Section II by Dr. W. H. Trueman, Philadelphia. Dr. Trueman was unable to be present to read his paper, and I therefore move that the paper be read by title and referred to the Publication Committee.

The motion was carried.

Dr. FINLEY. The business of the meeting having been completed, it now becomes our duty to install the new officers whom you have elected to preside over this association for the ensuing year. Before calling for these officers, I wish to express my deepest and most heartfelt thanks to every member of the association for his assistance in the conduct and welfare of the association during the past year. I think we can all say with truthfulness that this has been a useful meeting, that we have enjoyed ourselves socially and intellectually, and that fellowship has been of the best kind.

I will now ask Drs. Turner and McManus to conduct the new president to the chair.

Dr. FINLEY. It is with extreme pleas-

ure, Dr. Peck, that I grasp your hand and turn over to your care this office—the highest honor that can be conferred upon you by the dental profession. I feel, in doing this, that I could tender this office to no more worthy man in the profession than yourself. I now extend to you this gavel, and wish for you the success which has attended my efforts in the conduct of this association.

Dr. Peck, in accepting the office, responded as follows:

I shall not worry you with much saying at this time, for one year hence I shall have the advantage over you, for out of professional courtesy, if for no other reason, you will have to listen to me whether you want to or not. The time is now before us when work and action, of the right sort, are demanded.

However, there are many things I would like to say, and lest I might weary you with too much talk, I have taken the liberty of writing just a few words of appreciation.

Truly it would be evidence of unmistakable degeneracy were I unwilling to express to you my sincere gratitude at being placed in this position of high honor and of great responsibility. I believe I do not underestimate the magnitude of the responsibility you have here placed upon me, and shall strive to so conduct your affairs and my affairs in this connection that at the end of these twelve months you may not have occasion to say, "He has been tried and found wanting."

Yesterday afternoon, arm-in-arm with Dr. Crawford, while walking down the slippery path that led to the sumptuous feast provided at the barbecue, he said—"Peck, I am so glad you were elected here in the South." Dr. Crawford, that statement did not stop until it rested deeply in a tender and responsive spot in my make-up. It came to me in a double sense—personal as well as general. And I want to say, in a personal way, to each individual member of the profession now residing in this section—commonly termed the South—as well as in a general way to every member of the profession residing in this great country: The fact that the ballots cast yesterday which resulted in placing me in this, the highest position in the gift of our national organization, were cast on the soil of this great land the "Sunny South"—the land of ever-increasing wealth, of progress, of refinement, of culture, and of rare hospitality, will ever remain with me the extremest type of a kind remembrance.

I cannot refrain from expressing my sincere gratification because of the material progress that has been made during this meeting, looking to a unification of the vital forces of various members, that they may be turned into the path of usefulness. And no one will be found more willing than your humble servant to go to the greatest length consistent with the proper ethical action of one in a position of trust like this, to the end that the energies of the members of the profession may be united and applied as a common mighty force, emanating from a common center of inspiration, to the wheel of professional progress. And I ask you, members of this National Dental Association, and I ask all members of our great profession, to unite with me in an honest effort to advance the best interests of the profession and of this our national association.

And may the professional lives and endeavors of all of us be such that when the end comes we may have proved loyal to

our cause, no man being able to lay to our charge that we have played a traitorous part, such as is scorned by Sir Walter Scott in his well-known lines:

Breathes there the man with soul so dead
Who never to himself hath said,
This is my own, my native land!
Whose heart hath ne'er within him burned,
As home his footsteps he hath turned
From wandering on a foreign strand?
If such there breathe, go, mark him well!
For him no minstrel raptures swell;
High though his titles, proud his name,
Boundless his wealth, as wish can claim,—
Despite those titles, power, and pelf,
The wretch, concentered all in self,
Living, shall forfeit fair renown,
And, doubly dying, shall go down
To the vile dust from whence he sprung,
Unwept, unhonored, and unsung.

Dr. C. S. Butler, recording secretary, was next introduced, and following him the corresponding secretary, Dr. Burton Lee Thorpe—both of whom made a few appropriate remarks.

Dr. Thorpe. I move that a vote of thanks be tendered to the local committee of arrangements, the reception committee, and especially emphasizing our thanks to the ladies for the most courteous and lovely entertainment given to the visiting ladies and guests. I also want to have the association thank the newspapers of the city for their highly ethical and courteous treatment of this association in their reports of the meetings.

The motion was seconded and carried.

Dr. M. L. Rhein. I echo so strongly the sentiments of Dr. Thorpe in regard to the reports of the meetings of the association by the press of Atlanta, that I move that the corresponding secretary of the association be instructed to extend to the different newspapers of the city our appreciation of the manner in which they have reported our meetings.

The motion was carried.

Dr. R. Ottolengui. I move you, Mr. President, that we extend a vote of thanks to the Executive Committee for the manner in which they have discharged the arduous duties they have had to perform during this meeting.

The motion was carried.

Dr. James McManus. I move you, Mr. President, that we extend a vote of thanks to the retiring president and to the other officers for their work during the past year.

The motion was carried.

There being no further business to come before the association, the president, Dr. Peck, declared the meeting adjourned until the next annual meeting.

A. H. PECK, *Recording Secretary.*

MINUTES

OF THE

Meetings of the Executive Council.

First Meeting.

THE first meeting was called to order by Dr. H. J. Burkhart, chairman, in the Committee-room of the New Kimball House, Atlanta, Ga., September 18, 1906, at 9 A.M.

The list of papers, clinics, etc., as given in the printed announcement was accepted as the official program.

Second Meeting.

The second meeting of the Executive Council was called to order by the chairman at 11.30 A.M.

The Chairman presented the following report from the F. D. I. Committee.

REPORT OF THE COMMITTEE ON THE F. D. I.

ATLANTA, GA., September 18, 1906.

To the Officers and Members of the National Dental Association:

The delegates to the Fédération Dentaire Internationale beg to submit the following report:

Two meetings have been held since the last meeting of this association at Buffalo in 1905. The first meeting was convened in Hanover, Germany, under the presidency of Prof. W. D. Miller, of Berlin. This was purely a business meeting, at which there were representatives from seventeen countries. At this meeting two new commissions were authorized—one on the History of Dentistry, with Chas. McManus as chairman, and one on Dental Terminology, with John E. Grevers as chairman.

The Commission on Jurisprudence and Professional Ethics was directed to organize, with Wm. Carr as chairman. A committee of three was appointed to define what constitutes a "national committee," composed of E. Sauvez of Paris, Wm. Guy of Edinburgh, and A. W. Harlan of New York.

At this session Great Britain sent her national committee and permanently joined the F. D. I.

The only representative from the United States at Hanover was A. W. Harlan of New York, although there were five visitors including T. W. Brophy, president of the Commission of Education. The session lasted from 9 A.M. until midnight, when it was closed with a banquet.

The second meeting was held in Geneva, Switzerland, on Wednesday, August 8 and Thursday, August 9. Prof. W. D. Miller presided. Delegates present from the United States—Wm. Carr, A. W. Harlan, E. C. Kirk. There was also present T. W. Brophy, J. B. Littig, and others from the United States, England, France, Italy, Switzerland, Austria, Holland, and Belgium had a full delegation; Norway, Sweden, Denmark, Finland, Russia, Spain, Canada, Australia, and the United States had a partial delegation.

The Commission on Jurisprudence was fully organized, and Wm. Carr was continued as chairman. The Commission on History presented a report, but it was not organized at

this session. The Commission on Hygiene and Public Dental Service and the Commission on Education held full meetings, and did a great deal of work which will soon be published.

The Commission on Terminology added several names to its number and will present a report in 1907. The Commission on the International Dental Press was authorized to begin the publication of a quarterly journal, beginning with January 1, 1907. Paul Guye will be the editor, and the advisory board is composed of Prof. G. Port, of Heidelberg, W. H. Coffin of London, and A. W. Harlan of New York.

A committee to organize the Fifth International Dental Congress in Berlin, 1909, was appointed, composed of ten members of the National German Dental Society and five members of the F. D. I., all from Germany.

The proceedings were most harmonious, and closed with a dinner on August 9th.

The next meeting will be held in Amsterdam, the first week in August 1907.

All of which is respectfully submitted.

A. W. Harlan, *Ch'man*,
E. C. Kirk,
B. Holly Smith,
Wm. Carr,
Burton Lee Thorpe,
Committee.

Resolutions.

Whereas, The Fédération Dentaire Internationale is composed of delegates from all countries where there exist organized dental societies, and whereas the Federation is engaged in a work devoted wholly to the interests of the dental profession in education, legislation, and pure science; therefore be it

Resolved, That the National Dental Association of the United States in convention assembled in the city of Atlanta, Georgia, express its satisfaction in the work already accomplished during the past six years; and be it further

Resolved, That the delegates from this association be authorized to invite the F. D. I. to hold its meeting in the United States in 1908, at such place and time as it shall select.

A. W. Harlan,
Burton Lee Thorpe,
B. Holly Smith,
Wm. Carr.

On motion the report was received and the resolutions adopted.

On motion the sum of fifty dollars was appropriated to the F. D. I.

Dr. Chas. O. Kimball, chairman of the special Committee on Journal, presented his report.

On motion the report was received, and the secretary was instructed to notify the Committee on the President's Address to meet with the Council at 3 p.m., so that their report might be considered in conjunction with the report on Dental Journal.

The resignations of Drs. W. P. Dickinson, A. L. Northrup, S. P. Hilliard, W. G. Elliot, S. E. Knowles, F. M. Smith, W. E. Dieffenderfer, H. T. King, Thos. Fillebrown, C. R. Lindstrom, J. E. Keefe, and B. F. Arrington were presented, and on motion duly accepted.

Third Meeting.

The third meeting of the Executive Council was called to order by the chairman at 4 p.m.

Consideration of the reports of the Committee on the President's Address and of the Committee on Journal was taken up. The proposed delegate membership was first considered, and was discussed by Dr. B. Holly Smith, who made the following motion:

> That we receive members from any organized society in good standing with a membership of twenty-five or more, the same to be recommended by the president and secretary of said society.

On vote of the Council the motion was declared lost.

The report of the Committee on Dental Journal was taken up, and on motion the following committee was appointed

to formulate a resolution upon it, and to report to the Council at 11 o'clock Wednesday morning: Drs. J. W. Crawford, E. K. Blair, and C. O. Kimball.

On motion the election of officers was recommended to be advanced to 1 P.M. Wednesday.

It was moved by Dr. Chas. McManus that a committee of five be appointed to take under consideration the suggestions contained in the paper by Dr. Butler, on "The Educational Problem," the same to report at the next annual session—the committee to be appointed by the incoming president.

The motion was supported and carried.

Fourth Meeting.

The fourth meeting of the Executive Council was called to order by the chairman at 11 A.M. Wednesday.

On motion the Council was instructed to recommend to the association that the invitation to attend the barbecue for Wednesday afternoon as arranged by the local committee be accepted, and that the session scheduled for 2.30 P.M. be eliminated.

On motion the chairman was instructed to inform Dr. Donnally that his report would be accepted, and referred to the Publication Committee.

The report of the special committee on the proposed Journal was taken up, consisting of two proposed amendments to the constitution and by-laws. (See page 7.)

On motion the report was received and directed recommended to the association to lie over one year.

The publication of the Transactions of the present session was taken up for consideration.

Mr. Pearson stated that the *Cosmos* would publish the proceedings on condition that either the association or the various authors pay for all illustrations not used in the *Cosmos*.

On motion the Transactions of the present session were awarded to the *Cosmos* on condition that the authors of papers bear the expense of all illustrations not used in the *Cosmos*.

Fifth Meeting.

The fifth meeting was called to order by the chairman at 1.30 P.M.

Dr. Hetrick presented the following resolution by Alabama dentists, regarding Senator Pettus:

ATLANTA, GA., September 21, 1906.

HON. E. W. PETTUS, U. S. Senate, Selma, Ala:

Dear Sir,—The National Dental Association is now in session in this city—the very atmosphere is surcharged with enthusiasm. Dr. Williams Donnally, that noble and tireless representative of this association in legislative matters in Washington, feelingly tells us of the interest you have manifested in our great cause—the advancement of our profession—by your interest in legislation.

Therefore, we, dentists of Alabama, beg to express to you our congratulations and sincere appreciation of your generous, just, and able espousal of our cause.

Most respectfully,

[Signed by the following: Geo. S. Vann. T. P. Whitby. N. N. Vann. F. H. Johnson. H. C. Hassell. H. E. Ohme. A. T. Reeves. L. H. Pierson. A. W. Patton. W. L. Northern. Frank Whitman. B. C. Fowlkes. W. E. Allen, Jr. L. G. Pierson. W. W. Reynolds. J. D. Allen. J. G. Chisolm. F. H. McAnnally. J. A. Hall. J. H. Crossland. R. C. Young. Chas. L. Green (president Alabama Dental Association). J. P. Corley. W. A. Lovett. J. R. Walker. M. H. Tuttle.]

On motion the resolution was recommended to the association for adoption.

Dr. J. P. Corley, chairman of the Committee on Oral Hygiene, was requested to appoint a committee for the preparation of an address on Oral Hygiene, the same to be submitted to the next annual meeting.

Sixth Meeting.

The sixth meeting of the Executive Council was called to order by the president, Dr. Finley, Thursday, at 7.30 P.M.

On behalf of the Jamestown Exposition, Dr. Thorpe requested a provisional loan of five hundred dollars.

After some discussion the Council by vote recommended that if, after a time, the funds of the treasury permit, one, two, or three hundred dollars, according to which amount can be spared, be donated to the Jamestown Congress, with the proviso that the amount shall be refunded by said congress, should the funds of the latter permit.

Dr. CHAS. L. ALEXANDER presented the following report on the clinics:

REPORT OF COMMITTEE ON CLINICS.

Gentlemen of the Executive Council:

Your Committee on Clinics desire to submit the following report:

The committee have made a special effort to secure the very best clinical material, and believe that the results of yesterday's clinic, which were not great in point of number, will measure up as more than gratifying in excellence.

A detailed report of these clinics will be furnished in due time for publication.

Respectfully submitted,

THOS. P. HINMAN, *Chairman.*
CHAS. L. ALEXANDER, *Sec'y.*

On motion the report was received and referred to the Publication Committee.

The Treasurer's report was presented, and on motion was accepted and directed to be printed. (See report on next page.)

The Auditing Committee presented the following report, which on motion was accepted:

REPORT OF AUDITING COMMITTEE.

ATLANTA, GA., September 20, 1906.

To the National Dental Association:

Your Auditing Committee have examined and approved all of the accounts of the association that have been presented to date.

Respectfully submitted,

V. H. JACKSON,
W. N. COGAN,
H. B. MCFADDEN.

The following report was presented by the Committee on Credentials, and on motion was accepted:

REPORT OF CREDENTIALS COMMITTEE.

ATLANTA, GA., September 20, 1906.

To the National Dental Association:

Your Committee on Credentials respectfully report that they have examined and approved the credentials presented by the following societies:

District of Columbia Dental Society—H. D. Dawson, James T. McClenahan, and R. E. Layton, Washington, D. C.

Florida State Society—E. H. Pound, Jacksonville.

Georgia State Dental Society—F. C. Exley, and H. S. Colding, Savannah.

Indiana State Dental Association—W. H. Stephenson, Lebanon, Ind. Ralph W. Parker, Chicago, Ill.

Kentucky State Dental Association—McFerran Crow, Versailles.

Massachusetts Dental Society—Chas. E. Parkhurst, Somerville. D. Hurlburt Allis, Springfield.

Missouri State Dental Society—T. E. Turner, St. Louis.

New York State Dental Society—Geo. F. Jernigan, New York city. F. E. Taylor, Malone. D. H. Young, Attica. A. P. Burkhart, Dansville. W. H. Leake, Watertown.

REPORT OF THE TREASURER.

1905. RECEIPTS.

July 20—		
Amount on hand from last statement	$399.33	
Received of Dr. C. S. Butler, chairman Finance Committee of Fourth International Dental Congress	500.00	
" from Southern Branch	250.00	
" " members since last statement	2,410.00	
		$3,559.33

DISBURSEMENTS.

July 25—		
H. E. Roberts, expenses of section	$42.45	
W. E. Boardman, expenses as President	76.19	
Trade Circular Addressing Co.	2.00	
The Gunthrop-Warren Printing Co	4.75	
B. J. Stetson & Co., for printing programs	80.00	
A. H. Peck, expenses as Secretary	16.70	
Frederic Truman, expenses of meeting	34.40	
V. E. Turner, salary as Treasurer	100.00	
A. H. Peck, salary as Secretary	400.00	
E. K. Wedelstaedt, expenses of clinic	51.95	
University of Buffalo, " " "	99.45	
Geo. E. Savage, " " "	8.35	
L. L. Barber, " " "	7.60	
S. W. Bowers, " " "	11.70	
T. P. Hinman, " " "	5.00	
Mr. Baker, janitor's work	5.00	
Mrs. McGraw, " "	3.00	
August 30—		
J. N. Crouse, deficit in prosecution of bogus colleges	287.00	
September 20—		
Buffalo Dental Mfg. Co., replacing handpiece lost in clinic	8.25	
August 30— Forward	$1,243.79	$3,559.33
F. W. Gethro, expenses of clinic	1.50	
F. W. Stiff, Committee on Hygiene	21.42	
S. Eshelman, expenses of clinic	38.75	
C. S. Butler, badges	38.13	
" " " "	8.77	
" " " Local Committee	19.75	
Mrs. Elizabeth Boyd, stenographer	25.00	
Hotel Iroquois (Dr. Williams' expenses)	14.00	
J. D. Patterson, expenses of Executive Committee	4.00	
M. F. Finley, expenses of Executive Council meeting	70.15	
S. H. Voyles, expenses of clinic	7.86	
October 3—		
N. W. Kingsley, voted by Council	100.00	
March 23—		
Conrad H. Syme, cells	50.00	
Wms. Donnally, expenses of legislation	300.00	
November 14—		
The Gunthrop-Warren Printing Co	45.25	
Mrs. E. S. Boyd	17.45	
1906.		
May 18—		
Dr. Van Orden, earthquake sufferers	250.00	
August 6—		
The S. S. White Dental Mfg. Co., mailing Transactions	110.44	
September 17—		
Expenses of Treasurer's office	46.20	
		2,412.46
Balance on hand		$1,146.87

V. E. TURNER, *Treasurer.*

Audited and approved: V. H. JACKSON, W. N. COGAN, H. B. MCFADDEN, *Auditing Committee.*

New Jersey State Dental Society—T. F. Gifford, Woodbury.

Pennsylvania State Dental Society—S. B. Luckie, Chester.

Respectfully submitted,

V. H. JACKSON,
W. N. COGAN,
H. B. MCFADDEN,
Committee.

Dr. BUTLER reported to the Council, on behalf of the Executive Committee, as follows:

ATLANTA, GA., September 20, 1906.

To the Executive Council, N. D. A.

Gentlemen,—In the judgment of your Executive Committee, the work of Dr. Wms. Donnally, as chief promoter of all bills relating to dental corps in both departments of the service, has been conducted with an unselfish desire for the best interests of dentistry and for the well-being of those at present in the army corps.

Respectfully submitted,

J. D. PATTERSON, *Chairman.*
C. S. BUTLER, *Sec'y.*

Dr. J. Y. CRAWFORD presented the following resolutions:

RESOLVED, That the sum of $200 be appropriated to reimburse Dr. Donnally for whatever money he may have expended in Washington in the interests of dental legislation in reference to the army and navy of the United States; and

RESOLVED, That a vote of thanks be extended to Dr. Donnally and the other members of his committee for their untiring efforts; and

RESOLVED, That the Legislative Committee when appointed shall consist of five members; and

RESOLVED, That all matters of army and navy legislation shall be under the direction of the Executive Council.

On motion the report and resolutions were recommended to the association for adoption.

Dr. C. S. BUTLER, chairman of the finance committee of the Fourth International Dental Congress, presented the report of the committee, which on motion was accepted and ordered printed. (See page 8.)

On motion the usual salaries of the Treasurer and the Recording Secretary were ordered paid.

On motion the Council adjourned.

A. H. PECK, *Recording Secretary.*

Annual Address.

By M. F. FINLEY, President.

THE pleasant privilege of welcoming so large a number of professional brethren to this the tenth annual meeting of the National Dental Association is a source of extreme gratification to me.

The warm-hearted greetings from the chief executive of this state and from a local professional brother, voicing the sentiments of this community, which ranks so high commercially, politically, socially, and educationally, ought to inspire us to be faithful and earnest in our work while here, to measure up to the full standard of our obligations in seeking out the truths of nature and science and promulgating them for the benefit of humanity. Your very presence means that such will be the case, for only those devoted to the best interests of their profession will make the sacrifices necessary to attend such gatherings.

I congratulate you all upon this auspicious occasion in that so many are here, and that so many are to take part in the program of papers and clinics; such labors indicate a genuine love for the profession of dentistry, the profession you have chosen for your life-work and which is surely worthy of your best efforts.

On behalf of the National Dental Association I take great pleasure in extending to you all a most hearty welcome and a cordial invitation to participate in the deliberations of this meeting. This occasion is one that I cannot let pass without again voicing the strongest sentiments of appreciation of the honor with which this great association invested me in Buffalo last year, and without again sincerely thanking you for the confidence thus manifested. For twenty-seven years my name has been on the rolls of this association and its predecessors, and thus it has been my privilege to know the great lights in dentistry of that period —which knowledge has been to me a constant source of inspiration and pleasure. This association and its predecessors have made enviable records in history through the efforts put forth in their name.

With these influences as incentives it has been my earnest desire and utmost endeavor to fulfil the obligations of this high office with truth and justice as guides. I realize the limitations placed upon human individual effort, and, so doing, have sought advice and counsel from those more experienced before taking action upon any matter which came to my notice.

Since the Buffalo meeting a series of important events have occurred demanding deliberation and action to which I will now invite your attention. The first

matter requiring consideration was in consequence of the prevalence of yellow fever in the ports of the southern states last summer and fall, and a request came from members and officers of the association for a change of date of the Atlanta meeting to avoid what seemed a danger for a meeting to be held in the South in September. A postal-card vote was suggested to make the date of meeting in October instead of the date fixed by vote of the association at Buffalo.

To remove the necessity for a change of date, which is always so disastrous to the attendance on such occasions, I determined to seek information and advice from the Public Health and Marine Hospital Service, and forthwith wrote to the Surgeon-general of that service and received the following reply:

TREASURY DEPARTMENT, WASHINGTON,
November 27, 1905.

DR. M. F. FINLEY, President National Dental Association, Washington, D. C.

Sir,—The Bureau is in receipt of your communication of November 25, 1905, requesting to be informed, in the interest of the dental profession, whose National Association meets in Atlanta, Ga., next September, what the probabilities are for a return of yellow fever next summer in the ports of the southern states.

In reply, you are informed that while there is always a possibility of a recrudescence of the disease, the Bureau does not regard a recurrence of the fever as a probability, and measures are now being taken and will be continued throughout the winter to prevent such a contingency. While not assured of the success of such measures, the Bureau has faith in their efficacy.

Respectfully,

A. H. GLENNAN,
Acting Surgeon-general.

This reply was communicated to those who had written me about changing the date of the meeting, and was the assurance needed to quiet anxiety and settle that point.

Another matter of great import was the appalling disaster which befell San Francisco and other near-by cities of California when the earthquake and fire made such havoc.

Communications both by wire and by mail reached me from the chairman of your Executive Committee and Executive Council, suggesting a contribution from the funds of this association to aid our suffering professional brethren. After considerable correspondence with other officers of the association to ascertain the amount of funds available, an order for $250 was drawn on the treasurer, to be sent to Dr. Leander Van Orden, San Francisco, secretary of the Dentists' Relief Committee, to assist the distressed in our profession. Indorsement by the association of this action is hoped for. Also, after consultation among the members of the Committee of Fifteen of the Fourth International Dental Congress, it was determined to send from the funds of that organization the sum of $750 for the same object, viz, relief of earthquake sufferers in California. Following is Dr. Van Orden's letter of acknowledgment:

2417 WASHINGTON ST.,
SAN FRANCISCO, CALIFORNIA,
May 22, 1906.

DR. M. F. FINLEY, Treasurer Fourth International Congress, 1928 I st., N. W., Washington, D. C.

Dear Dr. Finley,—Please accept our grateful acknowledgment of the receipt of the most generous gift, $750, through your hands, from the Committee of Fifteen of the Fourth International Dental Congress. It comes most opportunely, for we have exhausted the money so generously sent from Chicago. While our men are bearing themselves bravely in the face of disaster, we fear that there are some cases of serious distress, which we hope to justly seek out. We will be glad to try

to limit the benefaction to ethical practitioners, though every class of us must be impressed with the deep-down satisfaction that comes only from generous, unselfish fraternal co-operation. We can only hope that the great geographical distance of California will be offset in the future by the short road of fraternal effort, and that our memories may be long ones. We will gratefully acknowledge the donation from the National Dental Association.

With personal appreciation, I am

Yours sincerely and hopefully,

LEANDER VAN ORDEN,

Sec'y Dentists' Relief Committee.

INCORPORATION OF THE N. D. A.

Again: Information was brought to my attention, in rumors, of a determination to supersede the National Dental Association by organizing another association of a national character, or reviving one of the old associations to which the National Dental Association succeeded.

After careful thought, consultation, and advice, it was determined to incorporate the National Dental Association as successor to the American Dental Association and the Southern Dental Association, in order to protect this organization in its rights and perpetuate it for the good it had done and might hereafter accomplish. Herewith is the document setting forth that action:

CERTIFICATE OF INCORPORATION OF THE NATIONAL DENTAL ASSOCIATION.

The undersigned, MARK F. FINLEY, J. H. LONDON, and W. N. COGAN, all being of full age, citizens of the United States, and residents of the District of Columbia, desiring to associate themselves and the present members of the unincorporated society known as the "National Dental Association" (successors of the unincorporated societies known as the "American Dental Association" and the "Southern Dental Association"), in the formation of an incorporated society, for the purposes and objects hereinafter set forth, do hereby certify as follows:

First: The name by which this incorporated society shall be known in law shall be THE NATIONAL DENTAL ASSOCIATION.

Second: The term for which this society is organized shall be perpetual.

Third: The particular business and objects of this society shall be to cultivate the science and art of dentistry and of its collateral branches, to elevate and sustain the professional character of dentists, to promote among them mutual improvement, social intercourse and good feeling, and, collectively, to represent and have cognizance of the common interests of the dental profession.

Fourth: The number of its Trustees, Directors, or Managers, for the first year of its existence, shall be sixteen (16), who shall be divided into an Executive Committee, consisting of nine (9) members, as follows, to wit:

J. D. PATTERSON, of Kansas City, Missouri.
C. N. JOHNSON, of Chicago, Illinois.
H. B. MCFADDEN, of Philadelphia, Pennsylvania.
V. H. JACKSON, of New York, N. Y.
C. J. GRIEVES, of Baltimore, Maryland.
W. N. COGAN, of Washington, D. C.
C. S. BUTLER, of Buffalo, New York.
G. V. I. BROWN, of Milwaukee, Wisconsin.
T. P. HINMAN, of Atlanta, Georgia.

And an Executive Council, consisting of seven (7) members, as follows, to wit:

H. J. BURKHART, *Chairman*, of Batavia, N. Y.
J. Y. CRAWFORD, of Nashville, Tenn.
CHAS. MCMANUS, of Hartford, Conn.
F. O. HETRICK, of Ottawa, Kan.
E. K. BLAIR, of Waverly, Ill.
M. F. FINLEY, of Washington, D. C.
A. H. PECK, of Chicago, Illinois.

Fifth: It is hereby particularly provided that all present permanent members of the unincorporated society known as the National Dental Association shall be considered as permanent members of this incorporated society, known as the National Dental Association, and shall be entitled to all the privileges of the class to which they belong, without further action.

Sixth: The above-named incorporated society shall have no capital stock.

Seventh: The present Constitution and Rules of Order of the unincorporated society

known as the National Dental Association are hereby adopted as the Constitution and Rules of Order of the incorporated society known as the National Dental Association, in so far as the same are not in conflict with any law now in force enacted by the Congress of the United States.

Eighth: The officers of this incorporated society shall be the present officers of the unincorporated society known as the National Dental Association, and all committees elected or appointed by the said National Dental Association, at its last annual meeting, held in the city of Buffalo, state of New York, on the 25th, 26th, and 27th days of July 1905, shall be considered the officers and committees of this incorporated society known as the National Dental Association, until their successors shall be elected or appointed, in accordance with the Constitution and By-laws.

In witness whereof, we have hereunto set our hands and seals this fifth day of March, A. D. 1906.

(Signed) { MARK F. FINLEY. [Seal.]
J. H. LONDON. [Seal.]
W. N. COGAN. [Seal.]

CITY OF WASHINGTON, } *ss:*
DISTRICT OF COLUMBIA.

I, Mason N. Richardson, a Notary Public in and for the District of Columbia, do hereby certify that Mark F. Finley, J. H. London, and W. N. Cogan, personally well known unto me as being the parties who executed the foregoing and annexed Certificate of Incorporation of the National Dental Association, personally appeared before me, in said District, and acknowledged the same to be their act and deed, and the act and deed of each of them.

In witness whereof, I have hereunto affixed my official seal, this fifth day of March, A. D. 1906.

(Signed) MASON N. RICHARDSON,
[Seal.] *Notary Public, D. C.*

Further: False criticisms of the work of one of the most important committees of this association were made, published, and circulated, in an effort to defeat the very purpose for which this committee was called into existence and for which it had so assiduously labored.

Resolutions have been passed by this association directing that all matters pertaining to the work of legislation should be transacted through this same committee. Had those criticisms been left to stand, and those making and circulating them left to pursue their plans, the work of this important committee, which had been ably supplemented by some of the best men in the profession and by the authorities of the best educational institutions of the country, would have been nullified and the profession's dignity belittled and degraded.

Consequently, after due consideration and consultation a special committee was appointed to look into and consider all questions involved. This special committee has prepared a report, and at a time to be designated it will be presented to the association.

At the union meeting of the Maryland State Dental Association and the District of Columbia Dental Society held in June, a paper was presented on "Pharmacopeial Revision," by Edward Hoffmeister of Baltimore, which contained a suggestion that the National Dental Association consider the advisability of sending delegates to the next convention for revision of the U. S. Pharmacopeia.

This suggestion seemed to me a good one, and to further the project I wish to present a few items of history. In 1817 Dr. Lyman Spalding of New York city submitted to the Medical Society of the County of New York a project for the formation of a National Pharmacopeia. The first general convention for formation of a National Pharmacopeia assembled in Washington, D. C., January 1, 1820, and published the Pharmacopeia adopted at that convention on December

15, 1820, since which time, at regular intervals, revisions have been made. The membership of the Convention for Pharmacopeial Revision is composed of representatives from the Medical Departments of the Army, Navy, and Marine Hospital Service; medical societies and associations, medical colleges and universities; pharmaceutical associations, colleges and universities of pharmacy.

The dental profession has so far advanced, and is so interested in the questions to come before this convention of revision, that I determined to write to the president of the U. S. Pharmacopeial Convention to ascertain if delegates would be received from the National Dental Association in the next Pharmacopeial Convention. Following is a reply:

LONGPORT, N. J.,
July 25, 1906.

DR. M. F. FINLEY, President, 1928 I st., N.W., Washington, D. C.

Dear Sir,—Your letter of July 12th has been handed to me for reply, Dr. H. C. Wood, president of the U. S. Pharmacopeial Convention being out of town on his vacation at Rangely, Me.

The next convention for the revision of the U. S. Pharmacopeia will assemble in the city of Washington on the first Monday of May 1910. My personal opinion is that the National Dental Association delegates would be given a welcome at the convention, with the privileges of the floor. I think it would require a resolution passed by the convention to receive the delegates as full members. I would advise writing to the president of the convention, Dr. H. C. Wood, about January 1910. He will probably authorize the appointment of delegates from your body.

Very truly yours,

JOSEPH P. REMINGTON,
Chairman Committee of Revision.

I would suggest that this association seriously consider this opportunity and prepare to send delegates to the convention.

Since our last meeting the Transactions of the Fourth International Dental Congress have appeared, and are a glorious monument to the credit of this association, which authorized and fostered that congress. The publishers should also be congratulated on such splendid work as is manifest in the make-up of those three volumes.

A full and final report of the Committee of Fifteen, which had in charge the organization and conduct of this great Fourth International Dental Congress, will be made at this meeting, every detail of the work intrusted to that Committee having been completed.

ARMY MEDICAL MUSEUM AND LIBRARY.

Especial attention is invited to the valuable exhibit pertaining to dentistry, in both the Army Medical Museum and Library, and again, I would urge every member of the association to make contributions, to this vast storehouse, of specimens which are of value and which otherwise may be lost to the profession—where they will be made of permanent benefit by their proper arrangement, display, and care, and will be a source of education, and will also in a most distinct way enable dentistry to make a record comparable to that of medicine.

The record already there is due to the earnest efforts of the committee of this association, whose hands should be strengthened by more and better support from the entire membership. I would suggest a revival of the effort by this association to induce Congress to appropriate for and establish the position of dental assistant curator in that institution. This plan was tried several years ago, and, with proper effort now, it is my opin-

ion that our profession would be recognized at this time by Congress to that extent. Such a position would afford wonderful opportunity for research work in many directions, and annual reports could be made which would stimulate and arouse zeal in the profession.

In the National Museum, an institution adjoining the Army Medical Museum and Library, there is also great opportunity for research work in both medicine and dentistry, but advantage is not being taken as it should be by the professions, of the available material the government is there collecting and arranging. Through an introduction by Dr. Bogue to an official there, it has been my privilege to note the possibilities for enabling valuable knowledge to be dug out of those collections, in a direction other than the course which those in the employ of the government are now pursuing. It is my suggestion, also, that this association establish a chair or found a professorship in research work in these government institutions, and make it permanent by appropriating a fixed sum therefor, believing that in so doing we will make a record to the everlasting credit of our association and our profession. Repeatedly have the members of the dental profession in Washington, D. C., conducted members of this and other societies through the above-mentioned museums and library, and in the interest of progress have endeavored to spread as broadly as possible the knowledge of the usefulness of the collections there accumulating.

COMMITTEE ON HISTORY.

This association is to be congratulated on the success which has attended the efforts of its Committee on History, which has, in the interim since our last meeting, offered to the members a volume of valuable historical interest to the profession. The membership should show their full appreciation of this committee's efforts, by quickly responding to the appeal which has been made for funds to publish this work. In fact, better and more unanimous and more unselfish support should be given to every committee of this association in their work if true progress is to be made in dentistry, and if that progress is to accomplish the most good that can be made of it. Your Committee on History further states that when this first volume is successfully published, a second and companion volume will be issued, treating of the more modern aspect of dentistry. How essential, then, that we come forward generously and place the sinews of war in the hands of our hard-working Committee on History.

COMMITTEE ON ORAL HYGIENE.

I cordially indorse the work of the Committee on Oral Hygiene, which has labored assiduously since its first establishment. A very interesting and valuable presentation of material for your consideration will be made at this meeting, and a solution is offered to the problem which has been uppermost in the minds of the leaders of the work of this committee, by a resolution to be offered and which was placed on the program that all might see it and be favorably impressed by it. The resolution is as follows:

> RESOLVED, That the National Dental Association authorize their Committee on Oral Hygiene to formulate and publish a "first edition" of a treatise on Oral Hygiene for the public; the total cost of compilation and publication to be not more than $250.

I recommend that this resolution be adopted after the Committee on Oral

Hygiene has made its presentation, as I think it is a step in the right direction which has too long been delayed. The chairman of this committee has offered to undertake the compilation of this treatise for love of his profession, which simply leaves the cost of publication to be borne by this association.

COMMITTEE ON ARMY AND NAVY LEGISLATION.

The association is more or less familiar with the work of this committee, which was first appointed at Omaha in 1898, and which has labored in season and out to obtain a proper recognition by the government in its military and naval services of the profession of dentistry, in the establishment of a dental corps with rank and right of promotion and retirement. A full and succinct account of the efforts of this committee will be presented to you in the report of its chairman.

DENTAL JOURNAL.

If a plan shall develop at this meeting to start a journal of the association, a consummation devoutly to be wished, I would favor the idea of our making a separate contribution of one dollar, in addition to the dues of the association as they now stand, for the support of the journal. This would instantly place a considerable sum at the disposal of a committee of publication, and would also make a legitimate list of subscribers to aid in securing postal concessions. Further, it would be my idea that the journal should be entirely owned and managed by this association, with no partnership arrangements with other associations or societies.

SECTIONS.

The question of how best to arrange the work of the sections to meet the demands of our membership has been a serious proposition for a good many years, and has been alluded to in the annual addresses of former presidents, and has been handled by the committees of revision of the constitution many times. It certainly would be advantageous if the opinion of this association could be made unanimous as to a final plan of procedure. To avoid some of the objections of the simultaneous meetings of the three sections, your Program Committee this year ask your co-operation and earnest assistance in the trial of the scheme of one section at a time, and the sections alternating instead of being in continuous session, thus avoiding the possibility of one of the sections not being reached at all, as was the case in the American Association.

I will repeat what appears in the announcement of the program. It is deemed wise by the Program Committee —in consequence of the seemingly prevailing sentiment that all papers be read so that the entire membership shall have an opportunity to hear and discuss them —to so arrange that only one section will be in session at a time; and, to make the plan feasible, an appeal is made, first, to essayists, to make their papers concise, crisp, and limited in length; secondly, to all those taking part in the discussions, to make them concise and crisp—to the end that the entire program may be carried out, thus giving to those who have been sufficiently interested to prepare papers an opportunity to read them and have them creditably discussed.

To make the discussion more general and give it direction, a synopsis of several papers was printed in the program for the benefit of those most interested in the subjects handled, and I would recom-

mend that it be the policy of the association in the future to print a synopsis of all papers in the program. There will be sufficient time allowed for carrying out the program, so that each section will have two sessions of at least three hours' duration, which should be ample time to compass the work mapped out if the members will be prompt in attendance, and will show an interest and make concerted effort to assist the committee.

Just here let me acknowledge with extreme gratitude, the very generous and hearty assistance and support of section and committee officers in securing and arranging the scientific matter for the program, and the same character of assistance and support from the general officers and committees, in arranging the details of preparation for carrying out the work of the convention, and likewise from the membership in all that has been done in the interest and welfare of this meeting of the association—all of which will help toward the general elevation and upbuilding of the profession in its various ramifications.

MEMBERSHIP.

In the interest of increasing the membership of this association, which is sadly in need of arithmetical or geometrical progression in order to make the figures commensurate with the number in the profession which it represents, I would recommend a change in Section 1 of Article IV of the Constitution, which reads, "Any permanently organized state dental society may send one for every six of its active members as delegates," etc., by eliminating the words "one for every six of"—making it read, "Any permanently organized state dental society may send its active members as delegates," etc. I suggest this in the belief that it will stimulate an interest on the part of different state societies in this association. There is a committee of this association on state societies, and it would seem to me that with the limitation removed as to representation from those societies, there might be some rivalry engendered, which would encourage an increase in delegates; and I would further suggest that a prize in the shape of a medal or certificate be offered to the state society sending the largest number of new members as delegates each year.

It is with very great regret that I note the absence of so many of our members because of unfortunate circumstances—such as sickness, calamities by earthquake and fire, and the wrecking of financial institutions—who, but for the intervention of these untoward events would be among us battling for the success of this meeting. I can but note with sadness and regret the removal from our midst, by Divine Providence, of so many of our faithful, conscientious, and devoted workers, whose remarkably lovable traits of character displayed upon all occasions were so lavishly manifested toward those who were fortunate enough to enjoy the acquaintance of these departed ones. I must mention by name two at least, with whom I have been so intimately associated for a goodly number of years in the work of this body—Chas. C. Chittenden and J. A. Chapple, as to whom it can be justly said that each of us is the better for having known them. The latter of these we had all looked forward to the pleasure of meeting at his own home, where alone the true genius of the man was displayed to its full capacity. We here offer our sincere tribute to all those who have left us since our last meeting, and deposit upon their tombs a wreath of perpetual remembrance; and we also hope

that through spirit communication they may be made aware of the genuine manifestations of regret at the loss those who remain have sustained.

But, to come back to the duties before us, we are assembled for a specific purpose, each with a task assigned—to do the utmost for the elevation and upbuilding of the profession of dentistry. By always maintaining the truth, being actuated by motives of justice, striving to conform to the tenets of the code of ethics, in the hope of seeing this profession, through its membership, constantly moving upward and onward in the scale of development, are we encouraged to the belief that right will prevail, that success will attend our efforts, and that dentistry will attain to the high ideals set for it by the most sanguine devotees in the profession.

[From Section II: Read in General Session.]

The Educational Problem.

By CHARLES S. BUTLER.

I HAVE prepared this paper on the Educational Problem at the earnest request of the chairman of Section II, and in its presentation shall offer for your consideration four propositions, the combination of which, in their working out, is designed to effect a complete though perhaps not a perfect change in our entire educational system.

(1) The abolition, by gradual absorption and elimination, of all our present schools, and the substitution therefor of departments in strong universities, with faculties selected by the profession itself, and for which each teacher shall be chosen with due consideration as to his known fitness to fill the position he is to occupy.

(2) The abolition of state examining boards, as being superfluous and of doubtful utility in any system of professional education.

(3) The creation of a national commission with plenary powers in regard to location of the schools, curriculum of study, and entrance requirements, as well as general oversight of their affairs.

(4) The diploma of said schools, when granted in course and indorsed by the national commission, to be accepted as a license to practice in any state or territory of the United States.

When, in 1839, men desiring facilities for adequate instruction in dental subjects were denied admission to medical schools, and their suggestion of a dental science was spurned with contempt as being beneath the dignity of men in charge of those institutions, the great science of medicine and surgery was set forward to a degree not easily understood by any at that time, and scarcely realized or appreciated by us today; for it is to the enforced establishment of separate and independent schools for teaching dentistry that is due in large measure the development of microscopy and the marvelous advance in our knowledge of histology, pathology and kindred sciences, as well as the wide application of antiseptics—for it was men engaged in the study of dental sciences who led the way and gave the impetus to their development. To it also may be traced the wide introduction into the curriculum of our public schools, of a system of manual training, the application and thoroughness of which is preparing as never before a generation of youths to enter upon a life-work of usefulness and profit. But great and far-

reaching as these have been, its greatest influence, undoubtedly, has been in leading to the development of a system of dental instruction peculiar to itself and in some ways not surpassed in efficiency in any other field of intellectual activity.

But notwithstanding its efficiency and apparent thoroughness, it is a serious question whether its limit of proficiency has not been reached; whether, indeed, there has not been a marked retrogression in the results of its operations during the past five years or more. To one who has been a close student for more than a quarter of a century, and always deeply interested in everything pertaining to our educational matters, this seems to be true; or to state it in another way—that our entire educational fabric is falling apart under the stress of its own weight. But, be this as it may, it certainly is true that the time has fully come when the profession itself should lay hold of this whole question seriously and with a determination to put our educational affairs on a plane relatively as high as that of the other learned professions. To do this some radical change of methods must needs be adopted; the number of the schools should be gradually reduced, and the quality and character of those remaining greatly enhanced. This may be done in two ways, but preferably, perhaps, by a gradual elimination of those schools now in existence by their combination with and absorption into departments in strong universities centrally located in different sections of the country, thoroughly established and well grounded in the true university spirit, and in the midst of large and prosperous communities.

Those of you who have observed closely the trend of educational matters during the past half-dozen years must have been impressed with two things—first, the inability of our present system to meet the demands of the profession; and secondly, the unmistakable tendency toward university departments in the schools themselves. That these things are observable is matter for congratulation, as at least showing a disposition on the part of the schools and of the profession to be dissatisfied with present conditions, and is a healthful and encouraging sign. It is a new spirit with us, and should not be repressed or discouraged; on the contrary, we should welcome it and seek to direct its energy. It does not follow that because men are dissatisfied that they are disaffected. All reforms and changes are awakened by dissatisfied men, but by disaffected men, never. This trend toward university departments, therefore, awakened by men dissatisfied with present conditions, is evidence of their own earnestness, and is readily explained and easily understood when the alliance is sought with universities where all of the departments are under one general management, where all of the teachers are employed at fixed salaries, and where the funds are used for the symmetrical development of the whole university.

The advantages growing out of an alliance of that character are so obvious that no institution concerned at all in its own welfare could afford to neglect it. But if it were possible for all our schools to be thus situated, which of course it is not, even then not all that is needed by the schools or is demanded by the profession could be realized; so that, while we may congratulate ourselves on this manifestation of a desire for better things, we cannot rest satisfied with this alone, even though it does offer advantages not easily obtainable by schools otherwise situated. The community of interests necessarily existing in the several depart-

ments of a university—the interdependence of these departments, but more particularly the "fraternity spirit," which means so much and which is so difficult to define or understand, and which can be developed in its highest and best sense only amid such surroundings, are some of the indispensable conditions necessary in the building up of schools of the highest efficiency and usefulness. Educationally speaking, we do not appreciate at its full value the true fraternity spirit. This is not strange; we see so little of it, for it is only to be found amid real university surroundings.

A recent writer in one of our magazines, speaking of Oxford, said: "This fraternity spirit is one of the greatest benefits to be derived from this old university. While it is not tangible or visible, nevertheless it is a living reality, and its potent force can be readily felt. It is a subtle influence, which enthuses one and gives him that true love of knowledge which at once marks him as a scholar. It wears down rough positiveness, softens the severity of prejudiced criticism, and cultures and refines thought—that is, true intellectual thought."

Under our present system, if there be any one thing more pronounced than another, it is that "rough positiveness" here referred to, for our entire educational training, as well as our professional practice, is made up almost wholly of dogmatics, and it is only by widening our intellectual horizon, through the medium of a truer appreciation of the value of the interdependence one upon another of the various departments in great universities, that we as a profession can hope to grow.

No profession can live unto itself alone, and continue to live. If it try to do so it will inevitably become, sooner or later, a dying profession. It must yield something for the general good, and it cannot retain the good it has already accomplished without striving for more. "In the lives of professions as in the lives of men, there is no level place, nor is there any brake to hold them at rest on the slopes where they are set." They must climb or they must slip. To mount or to fall, to grow or to decay, to grasp more of the spirit of progress or less, more of personal self-sacrifice or less—these are matters of choice; but we must choose, and upon the choice we make will depend, in large measure, the future advancement or certain decay of our profession.

The growth of a profession, like the growth of general education, is a part of the development of the whole intellectual life of the nation; and that nation grows best which harmoniously and aggressively identifies itself with the educational needs of its people. It is in the recognition of this law of the intellectual growth of the nation—or rather, the recognition of the needs of a people in their intellectual development—that the foundations of our universities are laid; a fact which we, though one of the younger of the professions, should be quick to recognize and appreciate.

Other and very marked advantages accruing to these departments would be found, not only in the curtailing of the number of schools, but also in the superior equipment, enhanced facilities by reason of location, environment, etc., and not the least of all in the concentration of patronage, thereby affording advantages not usually recognized, namely, in the stimulus to both teacher and pupil that comes with large numbers. It must always be remembered that it not infrequently happens that the very best work in any school is done by the individual

teacher with the individual pupil, but yet it should not be forgotten that the stimulus and encouragement that come with well-organized and flourishing institutions, where all the activities are running at flood tide, are far greater than with small, struggling, and oftentimes poorly equipped schools, no matter how high their ambitions or how honest their intentions. But the great problem to be worked out in this proposed change is not the recognition and utilization of the advantages accruing from its adoption, but how best to appropriate and assimilate all that is worthy and of value in our present schools. They all have vested interests which must be conserved, and of which each and all will be required to yield something for the general good. Just how this is to be accomplished is matter for future consideration. It is no part of the purpose of this paper to discuss that phase of the question, beyond saying that a fair and a workable solution of it is certainly within the bounds of reasonable probability.

(2) *As to the abolition of State Examining Boards.* In any system of professional education, examination, as by our examining boards, placed upon the products of the schools from without, is unnatural, indicating lack of confidence, if not actual distrust and condemnation. The examination and oversight by the profession should be placed upon the schools themselves, and should be so effective that it would be impossible for vicious and incompetent men to be graduated. This would at once eliminate any possible or fancied necessity for state examining boards, the existence of which has been a direct censure upon our entire educational system. These boards, through the influence of their national association, have done much to lower the standards and to bring the dental degree into disfavor both at home and abroad, besides harassing many of the schools, without accomplishing any useful purpose.

To some this may seem like a harsh criticism, and particularly so when we recall the many earnest, unselfish, and devoted men who have been active in the work of that association, and who have always intended and desired the very best, both for dental education and for the profession itself. The criticism is not of the men, but of the false conception on which the association was founded, and the fancied functions it was assumed that it had to perform. It is possible that had the association confined its efforts to the work of organizing and building up the state boards, perfecting and unifying methods of examinations, and in ways that were legitimately possible encouraging and assisting the schools in the real business of education, instead of attempting to dictate as to their internal management and to prescribe their standing and reputability, its field of usefulness might have been enhanced, education advanced, and its formation and existence seemingly justified. I say "seemingly justified," by which I mean under our present system.

But all this as touching the National Association of Dental Examiners has really no place in this discussion, and I have introduced it here only for the purpose of making clear the unscientific and unbusiness-like conditions under which our students are trained.

(3) *As to the creation of a National Commission.* The desirability of such a commission and something of the functions it might legitimately assume have already been hinted at, and it is only necessary to point out specifically its special

field of usefulness to make its importance, in any system of education such as ours, at once apparent. And first of all —and this undoubtedly would be its greatest work—would be the preparation and adoption of uniform equipments, uniform preliminary requirements, uniform curricula of study, and uniform intermediate and final examinations as to proficiency—this for all the schools, and as a basis upon which to begin the erection of a modernized system of education that would be commensurate with the needs of our profession. To these also would be added a general superintendence or oversight of the schools, with authority to veto unworthy faculty appointments, and the right of review of all graduation examinations, etc.

(4) *The diploma, when indorsed by the National Commission, to be accepted as a license to practice in any state or territory of the United States.* This would at once invest our degree with a dignity and value not possessed by any other profession. It would also prepare the way for the acceptance of a universal degree, and would become a strong, stimulating force in building up a system of education for our students which should equal that of any of the learned professions, and at the same time widen the scope of individual usefulness of all our members.

The training of the human mind, whether in primary or secondary education, has ever been deemed the highest duty and privilege of man, and the greatest intellects and first scholars of every age have not deemed it derogatory to their dignity to devote themselves to its consideration, and have ever held it to be the highest duty of the state and nation to provide liberally for the care and development of the people in their physical, moral, and intellectual life.

"Educate the people" was the first admonition of Penn to the colony he had founded. "Educate the people" was Washington's richest legacy to the nation. "Educate the people" was the unceasing exhortation of Jefferson, whose last years were concerned chiefly in establishing in Virginia a system of public instruction, the fruits of which are seen in her splendid institutions of today. So too with the arts and sciences. From the earliest days, liberal provision by the state and nation has been made for their establishment and maintenance at government expense. Astronomy, geology, and climatology, not to mention their kindred sciences, have received substantial encouragement and support from the public treasury. Not so, however, with the great science of medicine and surgery. From the days of Hippocrates to the present, medical science has fought its own way, developed its own progress, and established its own systems. And especially is this true of our own department in that great science. "Like the spider spinning its web out of its own inwardness," it has developed and expanded, unaided and alone, till it stands today as one of the foremost professions of the world. The great problem of education, of whatever character, has ever been, and still is, to secure in due proportions instruction and the development of the mental faculties. It is this which constitutes the chief difficulty, both in the common education of childhood and the special education of later life.

The human mind can be trained only by facts imparted to it, and the first object of all teaching is to so impart facts as to educate the mind in scientific thought that it may be able to found a judgment on the facts presented. To accept as true all that established authority says is true, or to fill the mind with such

statements by an effort of the memory, is false teaching, since by it the mind may become stored with error instead of truth. To determine that which is true or false, and to arrive at just conclusions, is of far higher value than a mere memorizing of facts, and should be the primary and ultimate object of all teaching. "And to thus teach," says Dr. Watts, "the instructors should not only be learned in the sciences which they teach, but have skill in the method of teaching, and patience in their presentation."

No intelligent man doubts for a moment that one hour's teaching by an expert is far more valuable to a pupil than two hours' instruction by a mere routine teacher, or that truths are far more effectively taught by those who have been tempered for their work by the glow that comes from a growing insight into some chosen mental field, and who know what devotion to truth for its own sake means. It is men thus trained and disciplined that are desired as teachers in our profession. Not that many of those hitherto and at present connected with our institutions of learning are not men of experience, education, and devotion; they certainly are all of these, and deserve the highest commendation and respect for what has thus far been accomplished through their efforts and skill; but who of them all is not required to divide his time, energy, and thoughts between his daily practice and his hours of teaching?—between a necessity for bread and a desire to impart knowledge?

It has been truly said that no artist, however skilful, who paints his pictures for so much apiece, or who is required to paint that he may live, can produce his best results. His must be a labor of love; he must be above financial necessity; his mind and energies must be given without pollution to the study of the true science of his art, if he is to exercise and display his greatest genius. And what is true of the artist is equally true of teachers and institutions. Any system of education which does not keep men constantly at their best work is unbusiness-like and wasteful; and who can estimate the loss already sustained, in that Miller, Black, Williams, Andrews, Truman—not to mention scores of other equally conscientious though perhaps less-known workers—have been unable to give themselves wholly to study, investigation, and instruction?

That the agitation for higher dental education and improved facilities for acquiring it is to become widespread and permanent, I fully believe. That it will also receive opposition and discouragement is safe to predict, for there are always those who, while not openly opposed to a forward movement, nevertheless do not accord to it the encouragement and support necessary for its accomplishment.

Among the many fallacies of the day that pass unquestioned there is none more fallacious than that change is popular. The truth is that he who seeks to alter the established order is likely to be, for a time at least, the most unpopular man in the community. He will be hated by those who are satisfied with the old evils; he will be disliked by the timid and lazy, who dread the perils and troubles of a change; and he will receive little encouragement from those most conscious of the evils, because his remedies will not act as a charm and remove in an instant the accumulated ills of centuries. We are not always conscious of the fact that in man the love of ease is far supe-

rior to the love of change. In the serious concerns of life, change is never desired for its own sake; habit becomes second nature, and it is only by the positive pressure of evil that we are driven to any reform. An old system must ever have two advantages over a new one—it is established and it is understood. We ought not therefore to be over-anxious to encourage a change in case of doubtful improvement; but in undertaking to bring about an improved condition in our educational system we are seeking that which will confer upon our profession and humanity benefits which cannot be properly estimated.

We are living in the present, but we must think in the future, and strive to build for those who are yet to come. The present becomes the past, and the future the present, in such rapid succession that the man who in any of the serious concerns of life does not think and live in the future, is certain sooner or later to find himself hopelessly in the past. And what greater incentive is there than this knowledge to awaken in us an irresistible desire and earnest purpose to lay broad and deep the foundation of that system which underlies all other systems—namely, the system which educates our students, and determines the character of the education which they receive?

Years undoubtedly will be needed for its complete accomplishment; but the gain of a little here and a little there, and the aggregate brought together into one complete, uniform, homogeneous whole, in which each and all are striving to encourage and assist in every honorable way, must eventually result in educational facilities for our profession which shall, in a larger measure, meet our peculiar needs.

Discussion.

Dr. Charles McManus, Hartford, Conn. The thing that strikes me most forcibly in the paper is that it is a radical study of the educational question presented in a very high-minded way. In the consideration of this subject, it is of course necessary to deal with several classes in the profession: those connected with the colleges, those connected with the boards of examiners, and perhaps a third class, which comprises what we may call the plain dentist, to which class I sometimes ask the privilege to belong, although, as Mark Twain said, I have friends in both of the other classes.

Evolution, of course, is something which looks to the future. It is certainly a fact that in the past many of the older colleges have had to depend for their strength largely on the personality of the great men connected with them; but possibly in the future, when our colleges will have become departments of the great universities, this will not obtain so generally.

As to dental examiners, I believe that there are some of them unworthy of the name. It seems necessary that we should have them under the present system; they must be there as a sort of dental policeman, but if our educational system can be placed on the high plane spoken of by Dr. Butler, there will be no necessity for the state dental examiner, and the best of them will be glad to find their occupation gone.

In closing I wish to speak of one particular phase of the paper—that in reference to the men who are dissatisfied but not disaffected; and it seems to me that therein lies the hope of dentistry or any other calling which desires to progress.

The man who is dissatisfied is ambitious; he is a constructionist—a builder-up; but the man who is disaffected is what we call a pessimist—one who tears down, and that phrase is the keynote of the paper—that there are so many in the profession who are *dissatisfied* but not *disaffected.*

Dr. S. H. Guilford, Philadelphia. Like Dr. McManus, I listened with great pleasure to Dr. Butler's paper, and if I were to criticize it, I should say that the best part of it was the rhetoric and the delivery, and that the poorest part was the ideas it contained. When I say this, I do not mean the general ideas to which Dr. McManus referred, as I think they are commendable. Dr. Butler is reaching toward something in the. future; something both great and grand, but when we consider his suggestions as to how to realize these high ideals, I regard them as utterly impractical and impracticable. It is very easy to present ideas and ideals, but we should have some knowledge as to how to bring them about. We should go into details, because without details we cannot hope to have the superstructure we are looking for.

In regard to the problem of eliminating the independent colleges—the small colleges—and establishing others in certain districts, and having them give all the dental instruction, it seems to me that the proposition is very much as though the board of trade in some city should say, "We have too many retail stores in this city. We want to eliminate the smaller shopkeepers and have only large department stores—one here and one there, readily accessible to the people." Now, would such a thing as that be practicable? Could we rob the small storekeeper of the privilege of conducting his business to the satisfaction of the people who trade with him? I say it cannot be done. The next question is, Would it be desirable to eliminate the small stores and have the work concentrated in the larger ones? Or, to make a similar application in matters of education, Would it be well to eliminate the small institutions of learning, and have them all concentrated in larger schools of education? I think that in order to decide this question, it would be well to consider what has been done, or what has been tried in other ways. Let us take the case of general education. The question as to whether education is best conducted in large universities or in the smaller colleges has been a living one in this country for many years. There are two things to be considered in regard to that matter; one is that in the larger institutions there exists a sort of fraternity spirit—that spirit which counts for something. The young man comes in contact with many other young men, he rubs against them and becomes polished, and the influence is a good one. On the other hand, the man who enters the smaller college does not acquire that great spirit that pervades the universities, but he comes into closer contact with his instructors; as the classes are smaller, the teacher gets nearer to the young men, and the personal influence exerted by the teacher over them is important and valuable—far more valuable than that which comes from what we call the university spirit. Therefore, this question has two sides—one in favor of the larger university, and the other in favor of the smaller colleges—and as it has not as yet been settled for general education, I do not think it will ever be settled in our time for professional education.

Now the presumption is, as I take it, that if our educational institutions were incorporated in a few large universities,

better results would be attained so far as teaching is concerned. This plan has not been productive of such results in other professional schools. We have many professional colleges that do not have such a great number of students, but many of the students graduated by these schools become very remarkable men. For instance, in Philadelphia we have the Jefferson Medical College, which is not connected with any other institution whatever; it is not under the supervision of the state authorities, and yet from it are turned out as many eminent men as from any medical school in the country. The teachers are great teachers, and nobody questions their ability or success as teachers. When we come to the question of the fitness of the men educated by the different schools, if you look throughout the dental profession today, select its best teachers and find out where they received their education, you will find that most of them have come from the smaller colleges.

I consider Dr. Butler's ideas with regard to incorporating the independent schools in the universities as impractical. How are we going to bring about this combination? We have throughout the country many colleges—fifty or more, and how were these colleges established? They were established by a number of dental practitioners who were willing to give their time and money for the purpose of founding them and building them up so that proper education might be given to the young men entering the profession. How would you dispose of these men? Many of them have been teaching in these colleges for years, and are dependent on the salary they receive for their teaching. They have given time from their private practices to devote it to the teaching of students, and in many instances their practices have greatly suffered thereby, and in others have dwindled down to almost nothing. Now, what are you going to do with these men? You cannot care for them except in one way, and that way Dr. Butler did not suggest, namely, that we gather together in some mysterious way a large fund to reimburse these men for the sacrifices they have made.

In regard to the question of the boards of examiners, or the interchange of licenses—perhaps I can throw a little light on that subject by illustration. Quite recently I was in Canada, and I learned there what interested me greatly. They have been struggling with the problem of state boards or interchange of licenses, and they have brought about a tangible result. The Dominion of Canada is divided into nine provinces, and they have agreed that its own legislative body shall make the dental laws for each province. They have established in each province a board of examiners, which conducts the dental affairs of that province in the same way as the state boards in this country conduct the affairs in each state. They may adopt a high standard or a low one as they please. When a man wants to practice in a certain province, he must pass the examination prescribed by the board of that province, and if successful he is licensed to practice in that province and in no other. But the boards in these provinces have come together and agreed to form what is known as the Dominion Dental Council. That council is composed of two representatives from each province, being selected by the highest dental organization therein. These eighteen men constitute the Dominion Dental Council. They hold examination at certain places at certain times, and if a man who is practicing in any province

wants to appear before that council, he can go there and be examined, provided he has previously obtained a certificate in one of the provinces; and if he passes the examination of this council satisfactorily, he is given a certificate which entitles him to practice in any of the provinces of Canada. There, gentlemen, is a practical result. Now that would be difficult to bring about in our own country because of so many states, and yet they tell me in Canada that in order to get this interchange among those few provinces they have been working for years with the different legislatures until they finally accomplished this result. Though this represents long and arduous work, it seems to me that it is an idea that we might appropriate with advantage, and in that way overcome some of the difficulties mentioned by Dr. Butler.

Dr. S. L. Goldsmith, New York. I think we should hail Dr. Butler as being in the same class with such men as Jules Verne—as a man with a visionary imagination. I think, however, that he is nearer the realization of his ideas than Jules Verne was, because it seems to me that Dr. Butler is going to see his hopes realized during his lifetime.

In speaking of the profession as being divided into two classes—those who are dissatisfied and those who are disaffected—I think he should add one more classification, namely, that of those who are disinterested. The discussions of the men who speak on this subject must be weighed. We must consider what power is behind the throne; what is the power actuating the man, and then we may read between the lines.

The gentleman who preceded me, and whom I have known and respected for many years, has made comparisons between the dental educational problem and the workings of a board of trade. Gentlemen, are you willing to be classified with anything that is commercial? Can there be any comparison between commercialism and professionalism? There should be no competition between colleges except in matters of education. The great trouble with the colleges is the question of being able to pay the professors adequate salaries. They must make the revenues from the clinic room and the students' fees sufficient to meet the expenses of remunerating the professors; and by what right does an association of colleges assume to dictate to its members the fees they shall charge? The only question should be the question of educational standard of the different colleges. Is it in commercialism or in the maintenance of education and professional standards that the National Association of Dental Faculties has an excuse for its existence?

The question of the classes being too large in the larger institutions is simply a question of economics. It is true that if you have very large classes under the instruction of one man, the personal association of the professors and students will be less close; but it is possible to preserve that educational feature in large classes by subdividing them into a number of sections each under the supervision of a teacher. No educational institution should be expected to be self-supporting, and in my opinion only such colleges as are fully endowed, and those under governmental care, can lead a useful existence.

Dr. J. V. Conzett, Dubuque, Iowa. I have nothing but commendation for the paper. It may be true that Dr. Butler's ideals may not be possible of attainment, but nevertheless that is no reason for denouncing them, or for saying that an

ideal should not dominate the minds of the profession. It seems to be the best ideal we could have, although it may require many years to reach it, because our system of education must be of necessity a process of evolution. It is true that great things have been accomplished by our present system of education; great and honorable men have been turned out under it by the small colleges; and yet, on the other hand, it is likewise true to a very large extent that the commercial spirit has been fostered by these small colleges. They of necessity must depend for their existence on the fees received from students, and on the receipts from their clinics. Everyone is influenced by his environments, and this is where the student acquires the commercial spirit.

In the state of Iowa we have had three schools, and every man who is not connected with the schools regrets that there should be more than one school. One of them, however, has recently gone out of existence, which I think is cause for congratulation. There should be but one school in the state, and the university school will not be what it should be until the others are eliminated. The small schools do not have the highest class of men, simply because they have to depend on the fees received from their students, and they cannot be as strict as they should be in their requirements for entrance. The small schools must have men because of the dollars and cents they mean to the school; and men have come to me and asked the standard of preliminary requirements of such and such a school, and after being told have gone to other schools where the standard was not so high, and been accepted. There are many of these men who can do little more than read and write, practicing dentistry in our state today, who have been graduated by the commercial schools, as we call them. While it is almost impossible to eliminate these schools, I believe our efforts should be for elimination as far as possible.

Dr. Guilford has cited the case of the Jefferson Medical College of Philadelphia as a successful professional school not connected with any university. Undoubtedly there are some good schools which are not affiliated with any university, and yet these schools are hopelessly in the minority. Because of the fact that these schools must stand alone, it is almost impossible for them to stand on the highest professional basis.

With regard to the examining boards, they are a necessity, but if we are ever able to attain to the high ideal given us by the essayist, I do not believe the examining board will be a necessity.

Dr. Guilford spoke of Canada and the interchange of licenses there. I believe that is in direct line with Dr. Butler's ideal, and if we are able to work out that idea in this country it will not be necessary for us to spend so much time in attempting to obtain reciprocity between the states. If we had our education concentrated in the universities, they could readily agree upon a plan by which some such board as that spoken of by Dr. Guilford could come into existence, and then all would be able to practice in any community whatsoever.

Dr. W. R. Clack, Clear Lake, Iowa. Dr. Butler has said some very disagreeable truths in a very pleasant manner. Not all of us are able to say these things in the nice way he has said them. Even Dr. Guilford has subjected himself to criticism when he gave the illustration he did. I do not believe that he really intended to put the dental profession of this nation on a par with the keeper of

the small stores. My father was a minister, and he used to say that when God called a man to preach, He at the same time called a congregation to hear him. I believe when the Lord calls a school into existence, He is also going to call students to support that school, but a great many of these schools have not been called by the Lord, they have been called by men, and by men who have only a commercial interest in view. I know whereof I am talking, in one particular instance at least. A university in the northern part of Iowa thought they should have a dental department in order to give the university the proper standing before the world. To that end they called a meeting of the medical men of the profession in that district, and while I am not a physician, I was invited to attend the meeting, and at that meeting I heard things unwittingly laid on the shoulders of the dental profession that made my face burn with righteous indignation. They said the university needed money to succeed, and they believed the greatest money-maker they could get would be a dental department. They said, "The dental clinic always is a money-maker, and we can make that money carry along the other departments of the university." There was a man present who had been tendered the deanship of that proposed dental department, and he rose and said, "Gentlemen, a mistaken idea of the ethics of dentistry obtains among you here tonight. I was asked here under the supposition that you wished to organize a dental school upon a high plane, and my only answer to you is this: that if you wish to organize a dental school which shall be better and higher than any dental school in Iowa, I am with you heart and soul; but if you wish to merely organize another dental school, I am not."

I believe that course taken by the profession at large would eliminate many of these schools that have been called by man. There are so many of these smaller schools, that they are tempted by lack of funds to take any man who applies for matriculation. The profession of any state can have a dental school that is entirely above financial considerations, if we will all put our shoulders to the wheel and work—a school the possession of a diploma from which will be "letters patent" on its face that the man has not merely *completed the course of study,* but that he is *qualified to practice dentistry.* And in order to do this these institutions will have to have men able and competent to *show* these students what they are trying to teach them. The practice of dentistry is very hard indeed to learn from text-books. The schools must have men that can show the students what they mean, and they must have men of the highest order, so that these students may be shown the highest ideals of dentistry.

Dr. Butler's ideas were spoken of by Dr. Conzett as being visionary. Gentlemen, you must have visions. It is not within the power of every man to see these things clearly, and we must set our target high or we will never shoot high.

Dr. Truman W. Brophy, Chicago, Ill. I have listened with a great deal of interest and pleasure to the paper presented by Dr. Butler, and in it I find very much material for careful consideration by men engaged in dental educational work. Certain passages in the paper I think were somewhat theoretical, and cannot be well put into practice, especially under the present conditions. What Dr. Butler needs to master in the carrying out of his views on this subject is that which

some men have been pleased to call commercialism. I have found that men who discuss the subject of dental education and make reference to commercialism—if I understand what the word means—are men who have never been in the harness and learned what it is to struggle for the procuring of funds to equip an institution, to supply the necessary materials for carrying on the work and for the paying of demonstrators and teachers who must give up their time for teaching. Commercialism so looked upon and discussed should not be brought into consideration in this connection. What Dr. Butler requires would be millions of money, with which to endow these institutions so that they would never feel the need of funds for carrying on their college work as it should be done. And tell me, gentlemen, if you can, where there is a dental institution in this world that has an endowment of a dollar? Name a state in this Union which appropriates a fund for the carrying on of dental work? And failing, as you must, to answer my question in the affirmative, and realizing that you must have money for the carrying on of dental education, then you must consider the source from which this money comes. There is only one source, and that is the fees paid by the students for their education. Can anyone name an institution that has an endowment or receives an appropriation from the state?

A Member. The University of Pennsylvania Dental Department.

Dr. Brophy. The University of Pennsylvania Dental Department has not a dollar of endowment. I am willing to submit this question to the trustees of the university for an answer, and that board will say that there is not a dollar of endowment for the dental school. This information was given to me direct from Dr. Kirk, the dean, and there are many here who can verify my statement. Two years ago—before preparing a paper on the subject—I wrote to the dean of every dental college in the United States, and asked this question, "Have you an endowment for carrying on college work?" And the question was invariably answered, "No." If there is anyone here who will rise and say that there are schools that have endowments, then I stand corrected.

Dr. Goldsmith. Is an endowment only possible in dollars and cents? Is not land considered as an endowment?

Dr. Brophy. Do you mean to say that the Dental Department of the University has land?

Dr. Goldsmith. I mean to say that the state of Pennsylvania has given large tracts of land to the university, and that in return the latter has scholarships which it allows to high-school graduates of the city of Philadelphia; and I happen to be one of them.

Dr. Brophy. Do you mean to say that the University of Pennsylvania is a department of the state?

Dr. Goldsmith. I mean to say that it has the indorsement of the state.

Dr. Guilford. You mean the city of Philadelphia.

Dr. Brophy. The young man is misinformed, and I will try and set him right. I want to say that the University of Pennsylvania is not a department of the state—it is not a state institution. I will go farther, and state that it is not a state university, and I challenge anyone to refute the statement.

Dr. C. M. Work, Ottumwa, Iowa. The University of Iowa is one of those institutions which Dr. Brophy says does not exist. It is governed by a board of re-

gents appointed by the governor, being recommended for appointment by election from each of the eleven congressional districts. The fees which that university receives from clinics and from students is turned into the state treasury.

Dr. BROPHY. There are four state universities that have dental departments —Iowa, Michigan, Minnesota, and California.

With regard to the question of a national board or a commission, I believe that such a board or commission is desirable in this country. The only drawback is that it would interfere with the legislation of the different states. We are like a number of different governments rather than like one government. A gentleman in another country asks what the qualifications for practice are in this country; and what are you going to say? We know that when a man qualifies in one state, and goes into another and attempts to practice, he is likely to be arrested as a violator of the law of that state; and yet if he has a qualification entitling him to practice in one state he should be allowed to practice in any state. He cannot do it, however, as the laws of the different states forbid. If my friend Dr. Butler will put himself to work on this question, and get that settled, so that we will be like one nation instead of many; so that a man who qualifies to practice in New York may go to Michigan or Pennsylvania or any other state and practice, then he will have accomplished a great work. As it is, we are the topic of adverse criticism throughout the world, because of the fact that we have no national qualification. I would like to see this rectified, and I will join in a movement for creating a national commission, made up of men who have ability and standing in the profession, before whom a man may go for qualifications that will stand anywhere and be a guarantee of his ability. I feel that this subject, discussed as it has been and presented in such a manner as the essayist has presented it, will result in great good. While none of us may live long enough to see the provisions of the paper carried out, we may live to see steps in advance that will result in benefit to the profession in general.

Before I sit down, I want to say that the dental institutions of this country stand today on an equality with any of the professional schools that we have. I am proud of the fact, Mr. President, that the dental colleges of the United States in the last twenty-two years have created a condition of things far beyond that which the most earnest workers in dental education deemed possible. We have advanced the standard of dental education to where it is at the present time. We have extended the course of instruction from one course of four months to a course which now means something definite. And in this connection I want to say that the standard of dental education as adopted by the National Association of Dental Faculties is better than any ever proposed before in the United States. We have a standard that means something. We have a standard in days and hours of time. We have a standard, not in an uncertain term of years which means nothing definite; we have a course of instruction extending over thirty weeks of six days each in each year, and continuing for three years, which gives as much as a four years' course of seven months, less about forty days. Some of the schools have adopted the thirty-two weeks' course, and if you will consider that, you will see that thirty-two weeks of six days each week, ex-

clusive of holidays, means the same as the four years' course of seven months. Now, when we consider that, we cannot say that the colleges of this country are encouraging a retrograde movement. If you had seen at our meeting the number of colleges desiring to advance the standard, you would have been convinced that we are working to hold the institutions together, to increase their usefulness, and lift the standard so that America will be in the future as it has always been in the past—among the first in the world in matters pertaining to the advancement of the dental profession.

Dr. C. W. Rodgers, Boston, Mass. I rise to discuss that portion of the essayist's paper with reference to the abolition of the state boards.

I desire to state that I come from a section of this country where the condition that the essayist wishes for actually exists. I have reference to university connections. In the New England States we have but two dental schools, and they are both connected with universities. I believe that this fact in itself has not helped to place dentistry in New England on a higher plane than have the various non-university schools of Philadelphia. Also this university connection has not carried with it any call for the elimination of the state boards.

The essayist seems to think that if we could have this national commission appointed we would not require the state boards. Now, the fact is that the state boards have been of the greatest aid to the two schools in New England. They have constantly kept them aiming higher. Another fact: If you go before the state legislatures and ask for the elimination of the state examining boards, and ask their approval of a national commission such as the essayist desires, you will run across a hard proposition. You would aim at destructive legislation and interference with states' rights, of the maintenance of which the state legislatures are individually very jealous.

The proposed legislation would be destructive, because its intent is contrary to the genius of our institutions, and if enacted would tend to aid in undermining our whole democratic system of government. Why, gentlemen, it is possible at the present time for a boy to ascend to the presidency of the United States without having seen the inside of a primary school, and you would ask legal aid to have conditions such that the boy with the ability to rise to the presidency could not rise to the practice of dentistry unless he be a graduate of a dental school. Our New England legislatures, when they gave authority to the state boards to examine applicants, did not say to them that they should examine graduates only, and it is none of the business of the board where a man gets his education, so long as he has it. That is the point we should not forget. The same idea is carried out in the catalogs of the various dental schools. They require a high-school certificate or its equivalent, and the word "equivalent" stands for an important principle.

I consider that the suggestion of a national commission supervising the system of dental education is all wrong.

Dr. Butler (closing the discussion). In closing this discussion, there is very little to be said in addition to what has already been presented in the paper itself.

I am not at all surprised or disappointed that those who have discussed it have failed to grasp its conception, or to rise to the level of its thought. I scarcely expected them to do so, as it looks

rather to the future than to the present, and is along lines which have not heretofore engaged the attention of the profession, and on which our educators have not been thinking. Hence it was hardly to be thought that a change so radical, no matter how commendable, would at once meet with favor.

We fail to realize, also, that all our advancement has been attained only after long, earnest, and sometimes contentious effort, and that it is always necessary for someone, even at the risk of unpopularity, to lead in any forward movement.

That reforms in our educational system are needed to meet the requirements of the profession all admit; that they are to come I am sure we all believe; but how and in what way is for the wisdom of the profession to determine. Just at present the greatest obstacle in the way of reform is the fear among our college men that any change, however simple, which will disturb the present condition of things will be harmful, and therefore is to be avoided. These men seem not to appreciate that our whole educational development has been, and must continue to be, a matter of slow growth. But as I said in the paper, we *must* grow, and to this end there must be constant unremittent and intelligent effort; and while the wisest advancement may not be along the lines I have indicated, yet it must be along some lines that will lead to a deeper, broader, and more comprehensive system.

To me it means much that within the past six years England has organized, equipped, and put into active operation not less than five universities for general and special education. And not the least interesting thing about these colleges is the fact that they are organized along the lines of our American universities, and that the dominant department in each partakes of the character of the principal industry of the town in which it is situated. For instance: Birmingham—Metallurgy and mining. Liverpool—Tropical medicine, marine biology, fisheries, electrotechnics and physical chemistry. Manchester—Chemistry and physics as they relate to cotton industries, and with a department in dentistry. Leeds—Cloth-weaving with a department in textile dyeing, coloring, etc. Sheffield—Ironmongery, cutlery, and mining.

Of course all this has no bearing upon the question of dental education, except as showing the general tendency along special educational lines in the industrial world. But are we to expect less in the professional world? It seems to me, not. On the contrary, should not professional advancement and the special education attending it lead everything else?

There is just one thing, I am pleading for today, namely, a wider interest in the profession itself in behalf of dental education.

Our college men are interested now; but we need more than this. With the whole profession actively and earnestly interested, there can be no question about the future. That the suggestions of the paper are entirely practicable, I have no doubt; that they are the best that could be adopted at this time, is for our wisest men to determine; but in any case it is for this association to lead the profession out into wider and more adequate facilities for acquiring the education our specialty demands.

[From Section III: Read in General Session.]

The Blue Light and Heat as Therapeutic Agents.

By A. W. HARLAN.

FOR several years hints as to the usefulness of the blue light have appeared in our journals and the daily papers, without much thought as to its utility as a therapeutic agent. Many years ago, from the experiments of General Alfred Pleasanton, Mr. Gladstone, Prof. John W. Draper, Schellen, Pancoast, and others, some things were learned with reference to the action of the blue light on vegetation and fruit-growing, but not much was obtained relative to its action in inducing relaxation of the nervous system as a whole. It was found that in all cases of "excessively accelerated tension," much relief was experienced when the blue ray was used.

It remained for Professor Redard to demonstrate by this means a sort of anesthesia which would enable the operator to extract a tooth or two after an exposure of the eyes to a blue ray through an electric lamp. This was done by using a sixteen-candle lamp, with a bright metal reflector, held at about four inches from the open eyes of the patient. The head and the lamp were covered with some dark blue cloth, and the room was darkened for about two or three minutes, when the anesthesia was sufficient to prevent pain in the extraction of two or more teeth.

After reading Professor Redard's article a little more than two years ago, I had a blue lamp installed; for some reason, however, it did not act perfectly well, so I used a reflector composed of a series of mirrors, which gave me much better results.

After a time I came to the conclusion that I could improve upon this, so I had a lamp case constructed of tin, lined with a thin sheet of asbestos, and the outside and inside painted and varnished a dark blue. After the lamp was adjusted, I had a blue glass slide so that the light would pass through the lamp and the slide, making it more effective. It now works very well, and I hope that it will enable many of you to perform small operations on the teeth and gums painlessly, without using drugs. In all cases of pain in the jaws an exposure of from two to three minutes will arrest it for several hours. This is true also when it is applied to bruises and sprains, or lacerations. I have extracted several teeth, one at a time, with this improved

lamp, and have removed deposits from the roots of teeth that were very sensitive before the exposure.

It may be that the series of mirrors will be an addition to the efficiency of this lamp, but I am not yet prepared to say that it is a necessity to obtain the best results.

THE BLUE LIGHT AND HEAT ON THE GUMS.

For more than two years I have used a small blue light on the gums for two purposes: The first is to cause a relaxation of the nervous tension; and the second, for the purpose of applying heat in connection with the blue light, so as to effect a double object—to prevent the development of organisms and to stimulate the tissues to a return to health. If the deposits are removed from the root of a tooth, and if they are carefully washed out of the pocket and around the gingival margin, this small blue lamp may be held within one-half to one-quarter of an inch from the gum for from two to three minutes, when the operation is suspended until the next day.

After six daily exposures, I allow the patient to rest for a week, when upon a close examination, if the deposits are found to have been removed, I repeat the exposure for another six days and the case will be practically cured. Great care must be used not to burn the gum tissue. If it be found that all discharges of pus from the pockets have not been arrested by these exposures, I give another period of rest to the patient and repeat the exposure. During the treatments no medicines are used at all, but I thoroughly massage the gums, and the patient brushes the teeth, using a simple powder. There is no objection to the use of any of the non-irritating washes during the treament.

The ancients were in the habit of using various colored lights in the treatment of diseases, but their systems fell into disrepute because they enveloped them with so much secrecy that only charlatans and impostors applied them. It was not until Finsen and Roentgen placed before the world their discoveries that a renewed interest was displayed in the utilization of various rays in the treatment of disease, as well as the diagnosis of obscure lesions.

These few observations are presented to you with the hope that operations around the roots of teeth and treatment of diseases of the gums may be much simplified, and that the dread of the chair may not deter so many persons from obtaining satisfactory dental service.

Discussion.

Dr. Gordon White, Nashville, Tenn. Whatever Dr. Harlan has given us in the past, as well as this last paper, I have found to be worthy of careful consideration. I regret that I was appointed to open the discussion on this subject, and I regret very much more that I know almost nothing about it.

We all know that the Roentgen ray has been used very extensively and successfully in lupus; and we know, or rather we are supposed to understand, that many cases have been cured in that way. That the various rays have therapeutic power is perhaps not questioned. It is, however, a question in my mind whether the law of suggestion does not play a part in the production of anesthesia by the blue light.

This is a subject worthy of consideration, as I said, which may prove of great value to us, and I hope that someone will discuss the subject who knows more about it.

Dr. J. Y. Crawford, Nashville, Tenn. In addition to thanking Dr. Harlan for his thought in connection with the use of the blue ray in the lessening of pain, I wish to state that I am one who believes that the chief advantage of modern scientific inventions is to make common sense exact. All along through my professional life I have observed through the medium—and his paper refers particularly to that suggestion—that through the medium of the orbital cavity and its nervous supply—through that window to the soul, the most marked and definite reflex phenomena are perhaps exhibited. Dental surgery has been slow to appreciate the value of the reflexes that manifest themselves so much under our observation. It does not require special observation to submit to clinical test the value of allowing the patient to have the eyes open during the process of an operation, and the action of light is more effective in the forenoon than in the afternoon, particularly when we have a northern exposure. If all the dental surgeons in the world tell me that by admitting the rays of light, through these cavities, say, to the optic nerve, and allowing these phenomena to manifest themselves—that under such conditions abnormal hypersensitiveness of the dentin is not modified by these reflexes, I know better. I believe Dr. Harlan will work out a very valuable contribution to dentistry by following out these lines of thought and experimentation. I am loath to agree with the last speaker that the phenomena of suggestive therapeutics have anything to do with the results in these cases, but I do believe in the therapeutic value of light under certain conditions. One of the most wonderful and remarkable things developed in modern therapeutics is that the various shades of light have different effects. Some are more markedly anesthetic than others. I think Dr. Harlan has clinically reinforced the conviction I have had for a long time, that at least thirty-three per cent. of the people of the United States cannot relax themselves at all, and all these persons are affected more markedly by the clinching of the eyes together.

Dr. H. A. Smith, Cincinnati, Ohio. Experiences have been called for from those who have made use of the blue light. I used it twelve or fifteen years ago. I was called upon once to extract some teeth for a lady, and it was done under the influence of the blue light from the direct rays of the sun. The lady was nervous and emotional to an extreme degree, and being a believer in the effects of the blue light, had had built an extension to her sitting room, which was lined with glass of a blue shade—quite a deep blue—especially in the ceiling. She sent for me to have several teeth extracted in this room. I visited the house, and extracted two teeth on the first occasion without, she said, causing her any pain whatever. In a few months afterward she sent for me a second time, and I extracted three teeth, again without giving her any pain.

I simply mention this to show that it is not a new idea or method. The concentration of the light upon special tissue I think is new, but there is a class of physicians who have great faith in the use of the blue light for its general effect upon the human body, and this lady was a believer in that theory.

Dr. N. G. Slaughter, Athens, Ga. I

would like to ask the essayist if he has ever attempted to extract a pulp under this light?

Dr. Harlan (closing the discussion). The idea of the use of the blue light is so ancient that there is not a man in this room old enough to be the great-great-grandson of the man who first advanced the theory. There have been many people who have installed in their houses rooms in which to get the benefit of the different kinds of light, principally the benefit of the blue-light bath. When a person is to take this bath he sits in the room for two hours at a time, with the back, arm, or whatever portion of the body he desires to receive its benefits exposed to the blue light. We all know that if you sit in front of a blue light for any length of time you will become drowsy and thoroughly relaxed. If you sit in front of a red light it excites, makes you restless and wakeful. I have experimented a great deal with this blue light, and it has been a wonderful aid to me. When I am to operate on a patient, I simply tell him that I will not hurt him. I then darken the room, and turn on this blue light, and when sufficient time has elapsed go to work without saying anything, and the patient says it does not hurt. I have not attempted to extract a pulp under this light, but I have been experimenting with it for about three years, and Dr. Gordon White was in my office about two years ago and saw some of the incomplete lamps, which are now more complete.

It affords me a great deal of pleasure to present a thought in connection with the utilization of an agent that anybody can handle without deleterious effects to the patient, unless the lamp be placed too close to the face, when it will burn the same as any other ray would.

SECTION I:

Prosthetic Dentistry, Crown and Bridge Work, Orthodontia, Metallurgy, Chemistry, and Allied Subjects.

Chairman—B. L. Thorpe, St. Louis, Mo.
Secretary—D. O. M. LeCron, St. Louis, Mo.

FIRST DAY—Tuesday, September 18th.

The first meeting of Section I of the National Dental Association was called to order by Dr. Burton Lee Thorpe, chairman, on Tuesday afternoon, September 18th, in the ball-room of the New Kimball House, Atlanta, Ga.

The first order of business as announced by the chairman was the reading of a paper by Dr. Richard Summa, St. Louis, Mo., entitled "Some Thoughts Concerning the Contact of the Teeth," as follows:

Some Thoughts Concerning the Contact of the Teeth.

By RICHARD SUMMA.

Fallacious and indistinct conceptions have ever tended to enrich nomenclature. Unfortunately, words thus coined not only failed to elucidate, but, on the contrary, complicated matters. In nomenclature, just as in mechanics, simplicity follows the solution of a problem.

In the dental world the pathological condition most commonly known as pyorrhea alveolaris is an example of such an unsolved problem, whose many names bear evidence of an indistinct and fallacious conception. An epithet may offer some consolation and even satisfy the self-esteem of some writers, but it never adds one iota to the solution of any problem.

And so it is in regard to the contact

of the teeth, both approximally and occlusally, especially the latter. Hasty observation of the interdependence of the dental arches has prompted the necessity of a more or less complicated terminology to designate harmony and the various degrees of inharmony.

While in case of so-called pyorrhea alveolaris its obscure etiology and its varied manifestations may be responsible for the continued use of its superabundant names, such reasons no longer exist for the diverse employment of terms to express the contact of the teeth of opposing arches. Although the etiology of malposed teeth is as yet but imperfectly understood, we are so cognizant of sufficient facts concerning the contact of the teeth as not only to preclude the necessity of a complicated terminology, but to plainly indicate simplicity of terms.

We know that the teeth of man erupt to take their places in a fixed order. Thus no one doubts or disputes that it is normal for the central incisors to erupt on each side of the median line; adjoining these the lateral incisors, canines, first and second bicuspids, and first, second, and third molars take their places. After recording this arrangement of teeth as the accepted one, I was just about to state that their approximal contact had never been an issue of dispute—when I became mindful of the discussion of Dr. I. B. Davenport's paper in 1887. (See *Cosmos,* vol. xxix, pp. 413, 445.) One must read the entire discussion to fully appreciate the prevailing misconception at that time—for which Dr. Arthur's teaching appeared to be responsible—as to the scheme of approximal contact of the teeth. It seems that this article, entitled "The Dental Arches of Man," embodied the first ray of truth which penetrated the delusion of that day. He directed the eyes of the thinking dental profession to that scheme of nature which provides a methodical approximal contact of teeth. This fact led the same author to the realization that for the fulfilment of their function the teeth of one arch must come into contact with the teeth of the opposing arch in accordance with an equally formulated design.

To express the contact of the teeth of opposing arches Dr. Davenport uses the word "articulation." Numerous other words have arisen to designate this anatomical relation. Many of these resulted from a different significance attributed to this contact, and most of them were the outcome of the innate unwillingness of one author to subscribe to the diction of another. It matters little what we call this contact, whether it be articulation, occlusion, interdigitation, antagonism, mordex dentalis, odontharmosis, or green cheese, just so we understand the picture to be conveyed by the word. Since we must call it something, I hope that in the near future all orthodontists may see fit to adopt the word occlusion, also recommended by Dr. Guilford in a paper read before this association last year. (See *Cosmos,* 1906, vol. xlviii, p. 135.)

Not only did the naming of the contact of the teeth of opposing arches create much discussion, but authorities also found difficulty in agreeing upon a picture and an adjective to designate a contact which is according to the standard or rule that is observed or claimed to prevail in nature. Some doubt has been expressed as to the justification of denoting a certain occlusal contact as "normal," because the design of nature in many instances is obscure. Admitting the frequent difficulties encountered in drawing a line between health and dis-

ease or between normal and abnormal, I believe that such doubt in case of the occlusal contact of teeth is as groundless as a doubt in regard to their alignment in the arch would be. It is my opinion that natural selection, which prevails in every phase of nature, tends to reproduce organs best adapted for the performance of the functions demanded of them so that they may endure in the struggle for existence. It seems to me but logical to assume that the germs transmitted for the jaws and teeth in any given case tend to reproduce jaws and teeth primarily indicative of the genus to which the parents belong, and that they only secondarily impress upon these organs the family characteristics of the more immediate ancestors. Therefore we would expect to find in man jaws and teeth peculiar to the *genus Homo,* and varying within certain limits according to racial and family characteristics.

No one who has been in the general practice of dentistry for any length of time could fail to observe identical malposition of the teeth of parent and child. To what extent these cases are hereditarily transmitted characteristics, and to what extent the conditions are due to similar environments, is so difficult to decide that I have no desire to argue the question, but I wish to state my belief that the orthodontist's duty is plain in either case. He must strive to place these teeth in the occlusal relations which are normal for that type of the genus. It is well established that the teeth of all mankind are not only of the same pattern and alignment in each arch, but that an identical occlusal arrangement prevails with equal certainty. The variations consist in a slight difference in the curvature of the arches and a difference in the position the dental arches occupy upon the bodies of the maxillary bones.

Many discussions of orthodontic problems have been suggestive of the idea that for certain types of the *genus Homo* thirty-two is too large a number of teeth, and that crowding of these reveals, therefore, a plan of nature to eliminate excessive teeth, especially for the purpose of improving the facial contour. If we stop to consider that utility is of first importance in determining everything of which we are conscious, the absurdity of this intimation becomes apparent. Beauty is secondary. We unconsciously accept as a standard of beauty that which utility inevitably forces upon us. Thus the African admires the prominent lower part of the face due to physiological prognathism. Prognathism with these people is a matter of utility. The Caucasian admires the facial contour resulting from orthognathism, which is also a result of environment, consequently a matter of utility, which thus creates a standard of beauty.

The dependence of facial contour upon the underlying osseous structure and the relative standard of beauty brings to mind the able article of Dr. Bebb, entitled "Disproportion in the Dimensional Relations of the Jaws and Teeth." (See *Cosmos,* 1905, vol. xlvii. p. 660.) He writes as follows: "If I interpret the orthodontists correctly, they would say the teeth of the bulldog are in perfect harmony with the supporting integument, only you must establish 'normal occlusion' by mechanical procedure, protrude the jaws and contract the arches until the teeth occupy their normal position, such as the conditions were before man interfered.

"The result would be what? A dog with body, limbs, and crania all in good

proportion, and with a long, narrow snout, like a wolf or coyote.

"Shorten the mastiff's arches until this noble animal resembles an overgrown pug dog, and would you not arrive at the conditions which the orthodontists seek in the human?"

Dr. Bebb's misinterpretation, for such it is, seems to be quite prevalent. First of all, if an occlusionist were asked to suggest a means to improve a bulldog's denture he would certainly not think of reducing the protrusion of that freak's mandible. On the contrary, he would endeavor to exaggerate this unnatural protrusion in order to enhance the relative beauty of this degenerate. However, we must keep in mind that the bulldog is not the result of natural selection, and this very feature of protrusion of the mandible at which the fancier aims would disqualify this poor freak to endure in the struggle for existence. The occlusionist is aware of the fact that the bulldog's relative beauty is enhanced in the same proportion as his ugliness increases and the usefulness of his teeth for the purpose of mastication diminishes.

Let us forget freaks, degenerates, monstrosities, etc., while trying to formulate a fundamental principle, and turn our consideration to the naturally selected and more important species, such as the mastiff. Again, the occlusionist would refrain from even an attempt to reduce the snout of a mastiff to that of a pug dog. He would endeavor to restore the dental arches to those positions upon the bodies of the maxillary bones which to the best of his knowledge are normal for that particular species.

In conclusion permit me to urge that not only should the orthodontists agree upon occlusion as the word to designate the contact of the teeth of opposing arches, but that this contact should be the basis of all their efforts.

Discussion.

Dr. S. H. Guilford, Philadelphia, Pa. Dr. Summa and myself agree on a great many points and we disagree on others. He belongs to what is sometimes called the "new school" of orthodontia, and he generally places me among those of the "old school," perhaps not so much on account of my views as of my age. So when I am spoken of as belonging to the old school, I want it to be understood that some of my views are the same as those of the old school, and a great many are in accord with those of the new.

Dr. Summa makes a plea for the use of the word occlusion, and alludes to the fact that I spoke on this subject before this body a year ago. In the selection of terms in dentistry we have the same difficulty that is found in many other branches of the sciences and arts—the difficulty of getting the right word to express exactly what it is intended to convey. In many cases the word does not exist, and we have either to formulate one or else to be satisfied with one that does not quite cover the ground. To illustrate this, dentists have always had difficulty in describing that portion of the tooth which lies beneath the gum. We have not a word to express it exactly. We once spoke of it as the fang, but the fang is outside, and not underneath the gum; then we spoke of it as the root, and while that is not strictly correct, it is the only word we have to express that idea. And this is so with many other words. For years we spoke of the "nerve" of a tooth, but we now call it the pulp. So also in regard to the matter of occlusion.

We have had a number of words—a half-dozen or more—that do not exactly express the idea the term should imply. The word occlusion does not quite express it either, but we must agree upon something. For many years we spoke of it as "articulation" of the teeth, and we have an instrument called the articulator to aid us in arranging artificial teeth, which operation we call "articulating" the teeth.

Now, in a measure that will do, but still, articulation means a great many things. For instance, when I speak, I am articulating, and we have articulation of the bones forming a joint. Now, on the other hand, occlusion means to come together; it means the act of placing different things in contact, end to end. It does not relate to the movements of the jaw, but it means coming together, and so while occlusion does not accurately express the idea, it expresses it better than does articulation, and consequently we have agreed to use the word occlusion.

Another illustration. Many years ago dentists were in the habit of speaking of the palatal for the upper, and lingual for the lower inner surfaces of the teeth. This is correct, but we have eliminated one of the words, and we call the upper and lower surfaces lingual because the tongue touches both. We are coming gradually to a better understanding of nomenclature, by the elimination of words that do not serve the purpose or intention. You know how common it is in everyday life, when we cannot find a word to express a condition or thing, to go to some foreign language for it. And the same thing applies with other languages in relation to our own. For instance the French people have no word for beefsteak, and so they call it "biftek." All do the same thing in regard to other languages.

One other point in Dr. Summa's paper I would like to speak of, and that is in regard to the classification of peculiar conditions. In many cases there is a peculiar abnormal condition of the jaw or in the arrangement of the teeth of an individual, and we notice the same peculiarity in the children of that individual. The essayist says he is not satisfied as to whether this is the result of heredity or environment. It is my opinion that it is not so much due to environment as to heredity, because certain other peculiarities which we see we cannot doubt have been due to heredity. I have in the course of practice seen two individuals each with one brown eye and one blue eye. They had inherited the characteristics of one eye from one parent and those of the other eye from the other parent. That was not environment but was direct transmission, and the same thing applies to other characteristics. But as the essayist also said, whatever the cause of malposed teeth, the duty of the orthodontist is to correct the abnormal condition.

He says a man never has too many teeth. There is no question of that, and in most cases it would be folly to lessen the number. I have taught, as have many others, that wherever it seems to be necessary to reduce the number of teeth, even by one, in the correction of an irregularity—such a course has to be considered in the very rarest cases—this procedure is simply a compromise between a difficult and a simple operation; a question of having a little good done, or not having any good done at all.

Dr. J. A. Gorman, Asheville, N. C. One of the principal points Dr. Summa brought out in his paper was simplicity,

which is the keynote of everything; it is especially so in orthodontia, both in the matter of nomenclature as well as in that of appliances.

Another point he brought out which is of great importance is the necessity for a study of both arches in the correction of irregularities. How many dentists do you see who come to the conventions with one cast of a mouth in which there exists an irregularity, and want to know how to correct it! What can you tell from one cast? Nothing at all. And yet we have dentists who pretend to straighten teeth by looking at just the cast of one of the arches.

One portion of Dr. Summa's paper appealed to me particularly, namely, the one in which he says that "We must strive to place the teeth in the occlusal relation which is normal for that type of the *genus Homo.*" This is something that we should always watch. So many dentists attempt to straighten teeth giving no thought or consideration to that requirement, and without consideration as to future results, frequently leaving the patient in a worse condition than before treatment was begun. Beauty is secondary to perfect occlusion; therefore, non-extraction—by all means! Normal does not mean "natural" as Dr. Guilford said, but typical or regular, and let us all apply occlusion as the basis of all our efforts.

Dr. J. W. Peete, Memphis, Tenn. Just one point in relation to heredity and environment—one question I would like to ask. If it is not environment instead of heredity that causes these peculiar conditions, why is it that these malformations of family types are in the permanent set only? We rarely see a deformity of the deciduous teeth, and it is perfectly natural that the deciduous teeth should be affected more than the permanent if it is due to heredity. I believe it is more due to environment in every case. Heredity may have a trifling influence, but I believe these malformations are mainly due to environment.

Dr. G. V. I. Brown, Milwaukee, Wis. I was very much interested in the fact that the essayist made the point—the chief one, as I understand it—of battling for a distinct term that would always represent the same idea. As to whether occlusion is exactly the word or not is a matter of opinion, but I believe it to be the proper term. The fact that we ought to have as nearly as possible a distinct term is beyond question. I am obliged to take issue somewhat with the essayist in regard to his saying that he was not dealing with freaks, and then going on with his paper. Of course, when you are dealing with orthodontia cases you are for the most part dealing with freaks to a greater or less degree.

As to the question of etiology, it seems to me that it should be elaborated upon in this discussion, and particularly in view of the point raised by the last speaker, that generally the deciduous teeth in the mouths of young children are at least to a very considerable degree regular, and he gathers from this fact that the tendency to irregularity increases as the individual grows older, and that it must therefore necessarily be a question purely of environment. Now that does not follow at all, and in order to know why it does not, one should go back to the study of embryonic sections.

Those who have thought on the subject know that this question is decided in a large degree during the very early periods of tooth-life. We know that during the fifth or sixth week the germs of

the deciduous teeth are all well under way. The follicle has begun to be formed, and can readily be shown by microscopic sections, and later on there is a budding off from it that becomes the follicle of the permanent set. Anyone can readily understand that even at that early period anything that might disarrange or disturb this cell development will interfere with its normal development. We agree with the essayist that there are certain characteristics which are apparent in these tissues. The tendency to irregular cell development applies not only to the developing teeth, but equally as well to other organs and portions of the body in course of development at that time; and consequently we have come to recognize certain types of dental irregularity as being characteristic of certain types of people.

Again, taking up the question of environment—this force not only disarranges the occlusion, but interferes with muscular action, and other muscles besides the muscles concerned in occlusion have much to do with the question of irregularity. In speaking of heredity I do not mean to attribute to it that which we recognize as due to environment. I recognize fully that any attempt at correction of this trouble without taking into account correction of these muscular forces will be useless, but I do not like to hear a statement made which places the entire responsibility upon one single factor, for it is apparent that it may rest in any case, according to the individual, upon either or both. As an example I want to speak of greater deformities. I have been keeping a record of cases of hare-lip and cleft palate, and find that the deformity in many instances in a particular family will skip a generation. This happens so often that one cannot question that heredity is a factor. If I once find in the clinical history of that family that there has been paralysis, tubercular tendency, or neurosis, the offspring from such individuals must be people in whom irregular cell development has occurred.

Dr. George E. Hunt, Indianapolis, Ind. Today, as ever, I approach the ground of the orthodontist with fear and trembling, because I know nothing about it, and I have a high respect for his knowledge of the subject; but rather than speaking of the patients of the orthodontist as freaks, I confess that I am often inclined to apply that term to the operator.

There is, however, one thing I want to speak of, and that is heredity. I was raised on Darwinism to a degree, and I still agree with him. The argument advanced this afternoon in regard to the regularity of the deciduous teeth as disproving the influence of heredity will perhaps lose force if we consider the conditions in the arches when the deciduous teeth are being erupted. These do not fill the arch as do the permanent ones. As the child grows there is an expansion of the arch, and at the same time the germs of the teeth are assuming their proper position in relation to the position that they will later assume in the matured jaw. It seems to me that the orthodontists ever since they have advanced the theory that because the deciduous teeth are regular, irregularities of the permanent teeth are due to environment, have failed to take into consideration the rapid growth of the jaws and the pressure of the tongue and cheeks in bringing the deciduous teeth into position. We have all seen deciduous canines erupting in an irregular position, but later assuming their proper positions through the

growth of the arches and the pressure of the tongue and cheeks. And I believe that we have evidences in other organs as well as in the teeth that these characteristics are due to heredity.

Dr. SUMMA (closing the discussion). I am grateful for the liberal discussion given this brief and somewhat unfinished paper. Its brevity is due to a request of the chairman; and while I also like short papers, I feel that one cannot do justice to a subject in too brief an essay.

Now, in the difficulty of agreeing upon a nomenclature, we resemble the followers of other branches of the sciences and arts. The great biologists have not been able to agree upon a nomenclature for the question of heredity, and if we study this we find that it all comes down to one theme, *i.e.* that there must be transmitted from the parent to the offspring vital units. These vital units have been named differently by different authors. One calls them *gemmules,* another *pangens,* another *biophores,* and still another *micellæ;* yet they are all one and the same thing—vital units. I assure you that the study of this question would also be simplified if biologists could be as harmonious in accepting one term as dentists have been in the acceptance of the term occlusion. I tried to be more explicit in a paper I presented at the last meeting of the American Society of Orthodontists, as regards the question of heredity, the transmission of acquired characteristics, and the effect of environment upon the position of the teeth. The best that I know at present is that every organ owes its *existence* to a transmitted germ, but it owes its *final form* to that transmitted germ plus the influence of external agencies. During the period of eruption of the deciduous teeth the external influences are less in power, but as the child lives on, it is subject to disease and other influences which impress themselves upon all growth, consequently we find a great tendency to malocclusion in the permanent set.

As to acquired characteristics dealt with in the problem of heredity, we ought first to decide what acquired characteristics are, and then we might, at least in a limited way, decide between transmissible and non-transmissible acquired characteristics; at this time I am only prepared to say that mutilations are non-transmissible. One could argue for hours along this line. There are those who argue that malposed teeth are due to environment, and then again there are those who argue that malposed teeth are due to heredity. I believe that some are due to environment, and others due to heredity, and it will be a problem for the orthodontists to distinguish between these two. We cannot expect to decide this except in a few cases. I believe that the tooth is the initiative for the existence of the calcified jaw, and the development and growth of the teeth mold the jaw under favorable conditions into a normal jaw, but under adverse conditions, into a badly formed jaw. The chief factors concerned in the development of the jaws are the growth of the teeth within them and the external influences, *i.e.* tension of the muscles of the cheeks, lips, and tongue, and the difference of atmospheric pressure from within and from without the oral cavity.

Dr. Guilford spoke of the "old school" orthodontists. There is not so much difference between the old and the "new school" of orthodontists, if we cast aside personal interests. Dr. Guilford and I agreed on more points than many expected. It is a matter of casting aside

personal feeling to work out fundamental principles, and the slight difference of appliances can be readily remedied.

In closing I wish to thank both the society and the discussers for their kind attitude.

The next order of business as announced by the President was the reading of a paper by Dr. GEORGE H. WILSON, Cleveland, Ohio, on "Phases of Art in Prosthesis."

The paper here follows:

Phases of Art in Prosthesis.

By GEORGE H. WILSON.

TWENTY years ago we had much discussion about dentistry being a specialty of medicine; today we are more concerned about the specialties of dentistry. There are several distinct departments of the science and art of dentistry that are being more or less specialized. The more prominent ones are operative, prosthetic, orthodontic, prophylactic, surgical, and mechanical. There is no well-defined natural line of demarkation between these specialties—each overlaps the other; however, arbitrary lines are being drawn. It is only necessary in this paper to define what we understand as the province of the department of prosthesis. Therefore we define prosthesis as the science, art, and esthetics of restoring a lost dental organ or organs and their associate parts with an artificial substitute. Science is the classified knowledge pertaining to the specialty; art is the skilful doing of the work; and esthetics is the harmonizing of the instrument with its environments.

This definition states, as the minimum field, a lost dental organ. Here is where an arbitrary line dividing the two departments, operative and prosthetic, is necessary. The prosthetist thinks that when so much of the natural tooth is lost as to necessitate the substitution of an artificial crown, the case belongs to his department; while the operator could justly claim the case so long as a restoration can be attached to the root. By the definition, a bridge undoubtedly belongs to the prosthetist, but a bridge cannot be attached without a crown, some modification of a crown, or some form of attachment that belongs to operative dentistry. Hence it is apparent that the line must be drawn with the crown of the tooth, giving the case to the prosthetist as soon as a full artificial crown is required. The setting of an artificial ready-made crown does not logically belong to prosthesis, and ought not to be considered as belonging to the operator. If the entire profession were divided into the two specialties —operative and prosthetic—and the line of demarkation as laid down were rigidly adhered to, there is no question but that more natural crowns of the teeth would be saved than if artificial crowns of some or all forms were considered as operative work. The treating and preparing of roots and teeth for crowns and bridges is really operative work, but it will usually be for the best interests of both patient and dentist if the prosthetist prepares the abutments for the superstructure he is to build. Assuming that the minimum field of the prosthetist is the

construction of a crown, and that he may be required to supply appliances for lost lips, noses, cleft palates, excised mandibles and maxillæ, and fractured jaws, his usual field of service consists in restoring masticating surfaces and the contour and harmony of the lower third of the face.

Society recognizes two kinds of art—utilitarian and esthetic. Someone has said that the difficulties of prosthetic restoration increase with the amount of lost tissue to be restored. As time is limited, we will consider in this paper only the restorations for well-resorbed edentulous jaws. We desire to discuss certain phases, both utilitarian and esthetic, of restoration, without discussing materials.

When the teeth are extracted certain physiological changes take place, which are usually quite complete in from one to two years. These changes consist of a resorption of a large portion of the alveolar processes and their integuments. Nature has designed, although in ninety-five per cent. of cases the upper teeth overlap the lower, that the dental curve of the lower teeth be greater than that of the upper, and the long axis of the teeth a slight incline, with the end at the apices of the lower teeth farthest from the center. It naturally follows that the relative positions of the curve of the summits of the alveoli are much changed as resorption takes place. As the alveoli of the maxilla recede upward and inward, the summit curve must diminish; and as the alveoli of the mandible recede downward and outward, the summit curve must expand; hence the anatomical relation of the summit curves has been entirely destroyed, and it has thus added greatly to the difficulties of a utilitarian restoration of the lost organs. Besides the changed relation of the fulcrum for the restorative appliance, the features have been distorted by the settling of the origin of five pairs of muscles of expression.

The depressor alæ nasi and compressor nasi both arise in the upper incisive fossa, and are inserted respectively into the septum and wing of the nose. By the process of resorption, either these muscles are stretched or the tip and wing of the nose are depressed. It is obvious that any attempt at padding out these muscles with an artificial appliance will only exaggerate the deformity.

The levator anguli oris arises in the upper cuspid fossa, and is inserted in the angle of the mouth. The resorption of the process does not put this muscle upon a strain, yet it is necessary in the artificial denture to notch out its periphery and buccal surface, just back of the cuspid eminence, or the muscle will be very much distorted and the patient will have the appearance suggestive of a constant snarl.

The levator menti arises from the lower incisive fossa, and protrudes or rolls the lip outward; thus when resorption has taken place, and a restorative appliance is inserted, no strain should be placed upon this muscle.

The depressor alæ nasi, compressor nasi, and levator menti explain why the periphery of the upper and lower dentures must slant from the cuspid eminences to the median line.

The buccinator arises from the buccal surface of the alveolar process of the maxilla, and is inserted in the buccal surface of the alveolar process of the mandible. As both the origin and insertion of this muscle have receded, it is apparent that a restoration to the original contour of the tissue is impossible. Also it must be remembered that this muscle is not

only a muscle of expression, but of mastication, and that too great an attempt at restoration will interfere with the retention of the denture.

When we consider that an upper denture is held in position by adhesion through contact, and possibly temporarily by atmospheric pressure—and in addition to this, the exaggerated relation of the summit curves, also the action of the buccinator muscles—then it can be easily comprehended why the physical laws of leverage are such an important factor in dental restoration.

If these statements are facts, then it is a logical deduction that it is a physical impossibility to make a perfect anatomical restoration. It is also a justifiable conclusion that the insertion of an artificial denture is no mean or trivial operation; that it requires the knowledge of a scientist, the skill of an artificer, and the judgment of an experienced esthetist.

Does it seem an imposition upon a trusting public for a careless operator who despises "plate work," with the aid of a mechanical laboratory to insert artificial dentures? Undoubtedly the patient will be better served because of the mechanical laboratory, even though it be a thousand miles away, than if the indifferent operator had made the "job." It is true there are operators with the esthetic sense so well developed that, with the aid of a mechanical man, they will better serve the patient than the average prosthetist, and possibly better than any prosthetic specialist. If this should be the case, it is because of the different caliber of the operator and the specialist. No argument is necessary to prove the assertion that any man, no matter how brilliant, will nearer reach perfection by confining his talents to a narrow line of work than by dividing his time and energies between several specialties that are only indirectly associated. It does not follow because a man is devoting his entire time to a special line of work, that he is enriching the field of that specialty, for there are comparatively few minds capable of originating and executing new ideas. Some one has said, "One truth discovered is immortal, and entitles its author to be so; for like a new substance in nature, it cannot be destroyed." Most of us follow, and do well to perfect ourselves in that effort. However, it is reasonable to suppose that any man will do better work if he confines himself to a limited field than if he tries to do many things.

Recognizing the changes that have taken place in both the hard and soft tissues, two things are required of the prosthetist: to restore the ability to masticate —and to beautify. The first of these is not within the province of this paper; and we regret our limitations in dealing with the other. However, we make our offering, trusting it may help some, and prompt others to carry the subject to its fruition.

Before we proceed we must define the two words, "normal" and "natural." Last year in his paper on "The Nomenclature of Orthodontia" (*Dental Cosmos,* vol. xlviii, p. 135) Dr. Guilford stated: "*Normal* does not mean natural, as one would often infer from its common use. Its definition is 'conforming to a type or standard.' Its synonyms are 'regular' and 'typical.'" *Natural* is pertaining to nature, as produced by nature. Thus we say the alignment of the teeth and profile of the face are natural, because they are as produced by nature; but they may or may not be normal. If they do not come to the line of harmony, they are not normal. If there is perfect har-

mony, then there is perfect beauty of form, dependent upon the beauty of the type.

We assume that the Creator designed that every soul should inhabit a perfect body. According to its type it should be like the Greek creation Apollo, every line and every inch godlike in its perfection. Had the original design prevailed, there could have been no beauty associated with the human form, because there would have been but one type, and each individual would have been a duplicate of all others. Beauty is appreciated by contrast only. The Creator also gave the laws of environment. Therefore we have no two persons that are exact duplicates of each other. As the body is molded and shaped by external mental and physical influences through conception and gestation, and by both external and internal mental and physical influences through infancy, youth, adult, and senility, there can be no perfect duplicate or absolute conformity to a given standard; and yet how wonderfully alike are human beings!

Ethnologists, physiognomists, and other scientists have divided and subdivided the human family into many classes for the purpose of better studying man. So far as prosthetists are concerned, our studies have been confined almost entirely to the Caucasian race, and we consider only such classification as will aid us in understanding the needs of our profession. We first divide the race into two classes—light (blond) and dark (brunette)—a simple classification easily understood and which calls attention to certain facts. The next classification is into "temperaments," dividing the race into four or five classes, according to the classification chosen. These divisions with their various combinations will carry us much farther into the physiognomical study of our patients; will establish types, and teach us to note the variations in each subject from the type.

Another classification we may call the "dental profile" classification. Scientists consider this subject as a study of the facial angle, and make two general divisions—orthognathous and prognathous. This division is of little value to the dentist, yet the study of the profile is perhaps the most important of all the classifications for the prosthetist.

For convenience of study we divide the dental profile into three classes—*straight* profile, *convex* profile, and *concave* profile.

Scientists, in drawing the perpendicular line of the face, have it touch the most prominent point in the median line of the forehead and the most advanced portion of the maxillæ.

The dental profile line is somewhat different from the perpendicular facial angle line.

The first class, or straight profile, is the ideal Greek face. The perpendicular line has three points of contact—the frontal and mental eminences and the middle of the wing of the nose. The lower lip will just touch the perpendicular line, and the upper lip will be a little in advance of the line. There is no question that this is the normal profile of the highest ideal of beauty.

The second class, or convex profile, has two points of contact with the perpendicular line—the frontal eminence and a point at the base of the nose that is the same distance from the middle of the back of the ear as the frontal eminence. In the type this point will be the center of the wing of the nose.

The ideal standard of this class has the face made up of rounded, graceful curves; forehead high and slightly reced-

ing; nose Greek or Roman type; lips full but not coarse; chin receding but not weak; teeth, both number and alignment normal. No competent orthodontist would think of converting this ideal of our second class into the first or straight class, for he would recognize that the harmony of the features would be destroyed.

The third class, or concave profile, has the frontal and mental eminences in contact with the perpendicular line. It is not possible to conceive of this profile being a mark of beauty, and it is fortunate that the class is small compared with the other two. It is a condition confronting the prosthetist, and he must place the features in as pleasing a relation to the concave curved line of the individual as possible.

The physiognomy of man is gradually changing and tending toward new types. The intermarriage of different nationalities and the modes of living, causing mental development and physical degeneracy, partly account for this condition. For the last few years the orthodontists have been impressing upon our attention the importance of teeth in the physiognomy of man, and giving us a rational reason for many of the abnormal conditions. This same study is of value to the prosthetist, as it aids him to understand the designs of nature for the individual case, and aids him also in classification. In studying the harmonies and inharmonies of the face, it is important that we consider the causes as well as the effects.

These few thoughts upon the profile have been given to impress the importance of the subject, and to show that it is a rich field for original work.

When the prosthetist has studied the individual case and classified it, he is confronted with the question: What is one's duty, to restore the features to the *natural* or to the *normal* condition? It is apparent that a normal convex profile should not, in a portion of its outline, be converted into the concave type, and thus form an ogee monstrosity. Each individual case must be kept within its normal class, and then it is a matter of judgment for the prosthetist and patient to decide how much the natural peculiarities shall be modified.

It should be borne in mind that physiognomists make a distinction between the anatomy and the expression. Expression is of the soul, by or through the anatomy. Therefore deformities of the anatomy may belie the soul. The prosthetist should study well to have the teeth of the proper size, color, form, and arrangement to harmonize with the rest of the anatomy of the face. The esthetics of prosthesis may be expressed thus—"anatomical harmony" and "pleasing in expression."

The next phase we shall consider is the prosthetist himself. For information upon the subject we sent a letter containing the following questions to seventy-one college teachers, and later to eight men referred to us as specialists:

Are you teaching Prosthesis? What school? Do you practice prosthesis as a specialty? Do you operate, or do any other line of dental work? Do you do laboratory work for other dentists? Do other dentists send their patients to you for prosthetic work?

Please give me the name and residence city of all dentists whom you know to be confining themselves to prosthesis as a specialty. I do not want parlor men, or commercial laboratory men who work for dentists only. I do not desire the name of any man unless he is a legal practitioner, and works at least part of the time for patients.

From the replies received we give the following summary: The number of men devoting their entire time to the prosthetic specialty is 11. Of these 4 are teaching prosthesis but not conducting a practice; and 1 is devoting his entire time to crown and bridge work and teaching. All others, though much interested in prosthesis, are conducting a general practice.

Who should take up the specialty of prosthesis? Those men who have been a few years in general practice, and have acquired a love for and a reputation in this line of work. No man is justified in giving up his general practice unless he is certain his dental *confrères* will support his efforts by referring their patients to him. The prosthetist must bear in mind that it will be the case—as it should be—that the patients, as a rule, will first go to an operator.

It is the opinion of the essayist that it is impossible to build a living practice as a prosthetist without the assistance of the operators.

The field is great, and there is room for a large number of skilful prosthetists if the dentists will support the latter rather than the cheap laboratories. With a body of men devoting their lives to the science, art, and esthetics of this specialty, we could expect great advancement within a few years.

Discussion.

Dr. C. J. Grieves, Baltimore, Md. I received Dr. Wilson's paper some time ago, and having studied it carefully, I must say that I am much impressed with his effort to give us definite mathematical lines by which we could produce art. I do not say that this is possible, but I do say we should try along those lines, and should thank Dr. Wilson for his efforts. I cannot agree with him in the contention that dentistry should be further divided into specialties. Orthodontia lends itself very completely, in my estimation, to assignment as a specialty, and for reasons we all know. Dr. Wilson has defined the prosthetist as a man who does everything in dentistry except the filling of teeth, the simple treatment of the soft tissues when such treatment is necessary, and that of the pulp-canal with its contents for the preservation of a tooth. All else, he says, is prosthesis, and operative dentistry is to be confined to some such limited field. Later on he tells us that the patient would naturally go first to the operator. I thoroughly agree with him, and believe it would be a great misfortune to divorce the laboratory—the old-fashioned laboratory—from the dental office. Historically we came near abandoning it at one time, when, on the introduction of vulcanite, the operator looked down upon the man who did rubber work, and the mechanician despised the man who would not soil his hands. Then came crown and bridge work into the breach, as, in my estimation, the greatest savior of scientific mechanical dentistry, bringing the laboratory nearer to the operating room, where it justly deserves to be.

So much of what Dr. Wilson calls prosthesis—beginning with the treatment of the root and the placing of the artificial crown, clear on through bridge work, dentures, vela, splints, and what not—is really operative dentistry, that it has for a long time been my belief that instead of separating prosthesis from the operative chair, prosthesis should be brought to the chair—that is, more operative methods should be applied to the production of prosthetic appliances. I

should consider it a great misfortune if dentistry were to be further subdivided, thus widening the chasm between prosthesis and operative dentistry. It is largely a matter of juggling with terms. The simple question is, whether the public will be better served, and the dentist made happier by such a subdivision, or whether both will not save time and be more contented if this work be done by one man; that is the point to be considered. For instance, no two men could possibly reach the same conclusion as to the exact time when the mouth is fit for the placing of a denture. On the contrary, if one man carries out all of the different steps in the operation, he may follow different methods from those of the specialist, but to my mind he will get just as good results. In the matter of excluding occlusion from the field of art in prosthesis, I think the essayist is decidedly paradoxical. No matter what the art may be made to embrace, it would not be possible to exclude occlusion from the process of making a denture.

Dr. Wilson has defined the muscles of expression, and has described their insertions. It is a rule in anatomy that if a muscle has one insertion it has another. These muscles have another insertion, and that is found in the orbicularis, and the orbicularis being a sphincter may be said to have a movable insertion in its contact with the teeth and the alveolus. Therefore, when the teeth are lost, contraction of all this mass of muscles including the orbicularis will follow; coupled with such contraction a shrinkage of the alveolus will take place. The alveolus is a transitory structure which, particularly after certain diseases, as pyorrhea, goes on wasting definitely. Thus we may have in mind for some such case Dr. Wilson's ideal convex facial line, and have to be satisfied with a concave profile eventually. All we can do is to produce utility combined with art. It would be the highest ideal, if we could bring our practice up to the standard set by Dr. Wilson, and I hope we may. If we can but learn and teach the art of prosthesis so that every man practicing it (and most of the gentlemen whom I see before me are practicing it), particularly those in the country and in the smaller towns, where it would be impossible to have prosthetic specialists, may do the best that is possible, esthetically, under the circumstances, after giving the occlusal lines and the arch and ridge due consideration, I think it is all that is needed and is that which we should be doing now.

Dr. C. L. Alexander, Charlotte, N. C. With regard to that portion of the paper in which the essayist refers to the line of demarkation between the prosthetic and the operative dentist, I think it would be very difficult to get both branches into closer relationship than he has described. While I do not agree with the essayist at all as to the matter of specializing, I wish every man practicing prosthesis could read his paper. If we had a better knowledge of the oral cavity and its associate parts before and after resorption, I am sure it would enable us to do more artistic and useful work, and to arrive nearer the ideal which every man must have in his mind as to how work should be done.

I am sorry Dr. Wilson did not describe some of his methods of arriving at results, because it would have helped us more than anything else. Theory is all right in its place, but without practical results it is a failure.

I will endeavor to describe one method that I have adopted in the making of arti-

ficial structures—say a full denture. After preparing the cast, I produce in modeling compound forms of such a shape as to represent the plate, teeth and all, just as we want them to appear in the mouth. By doing this, and putting the forms to place in the mouth, we can see where restoration is necessary, being careful to trim the forms to allow for all lingual and muscular movements. In this way we obtain casts which may serve as guides in the construction of the permanent dentures. Those of you who have not tried this method will find it a great help in arriving at satisfactory results.

Dr. B. J. Cigrand, Chicago, Ill. I am very much interested in this paper. It covers so much ground that I am at a loss to know where to begin or where to leave off. Dr. Wilson has gone over so much matter that I feel that I must congratulate him for the labor involved in the preparation of the paper. Anyone who attempts to give us anything new in what appears to us a foreign territory must, of necessity, give much of his time and considerable attention to the subject.

I am rather inclined to think that the essayist is going too far when he advocates so much specialization in dentistry. I do not believe in the subdivision of dentistry into too many specialties, viz, porcelain work, operative work, prosthetic work, and what is advocated by some—the subdivision of prosthetic work. I think we are subdividing too much, and I believe in this subdivision there is loss, because we lose the spirit of the general, and when we lose that we lose much of the substructure. I think the profession is sufficiently subdivided now for us to keep in touch with everything that we love. My profession is dear to me, and I do not like to hear of its subdivision if it can be avoided. I like operative work, porcelain work, and crown and bridge work, and I do not believe it is a good idea to advocate the subdivision of a subdivision; not that I think that what we say here today will be done tomorrow, but it may be done sometime. There is sufficient work for us to do in other lines, and if we can perfect the nomenclature of our profession, we will be building a straight line to a given point. There are too many words that mean the same thing. I would like to see our nomenclature simplified, so that when a statement is made, its real significance will be understood.

That dentistry is thoroughly and absolutely wedded to art is an emphatic truth; art in every phase of the word—in color, shape, shade, and build. There is in every phase of art something that appeals to us as dentists. When we walk out on the streets of this beautiful city of Atlanta, and see the great architectural structures, there is something which appeals to the dentist. When we go out into the realms of the railroads and see the immense bridges that span the streams, we find something there that appeals to us artistically. Everything in art is more or less part and parcel of what we as dentists are working for. We should not relegate too much to specialization, but keep close to the general practice, as it broadens the mind and certainly educates the hands. We should identify ourselves with other associations, meet in other conventions, and subscribe to other journals, in order to keep in touch with those who are laboring for the same thing as are we—to make more beautiful and preserve that which God has given us.

This subject is broad, and so far-reach-

ing that I will not attempt to go into it farther than to say that I am glad to have been called upon to discuss this excellent paper, since it is in thorough keeping with the art impulses of our calling.

Dr. WILSON (closing the discussion). I was very glad to hear the differences of opinion expressed, because that is the means by which we learn. If all agreed with me, then I should feel that I had not made any impression upon you.

Dr. Grieves somewhat misunderstands my position in regard to specialties. I do not for a moment advise any man to take up a specialty until it is taught in the colleges. When a man becomes interested in a particular line of work more than in any other, there is no question that if he confines himself to that line of work exclusively he will progress faster than before. It is also true that specialists are liable to become narrow in their views. Our whole profession narrows a man, and when it comes to a smaller part of the profession, it tends to make a man still more narrow. The question arises here as to whether we are working for the profession, or whether we are working for our selfish selves. If we intend to work more for self than for the development of the profession to which we belong, we should never go into any profession, because we will not do it any good; but if we are working for our profession and will specialize, we will probably do more for it than otherwise, provided we have the qualifications for that profession.

Consequently I say that Dr. Grieves misunderstood the meaning of my statement on specialties in the profession, and when he claims that I would have the prosthetist take in all of dentistry except a minor part of the operative man's work —that is, preparing cavities, inserting fillings, etc.—he likewise misunderstood my statements. There is a great deal more in the operative field than those operations. We have materia medica and therapeutics, and these subjects should be a great field for the operator. Of course he must put in fillings, as a part of the treatment, but there is a great deal in the therapeutics and pathology of dentistry. I would not for a moment have the prosthetist trespass in the field of the operator. His business is to take the mouth after the dental organs are lost, and not to attend to the operative phases of the work, because he is not prepared for it. And likewise the man who practices operative work and restores the teeth to their original usefulness should not enter the field of the prosthetist, because he is not prepared to undertake this phase of dentistry. I believe that as a profession we can advance still more by having certain men take up certain lines and follow them out. And I hope that the ideas I have advanced along this line will receive consideration and will do some good.

The next order of business was the reading of a paper by Dr. J. Q. BYRAM of Indianapolis, Ind., on "The Present Status of the Porcelain Inlay." Dr. Byram not being present, his paper was read by Dr. George E. Hunt of Indianapolis, as follows:

The Present Status of the Porcelain Inlay.

By J. Q. BYRAM.

THERE are periods in the history of the dental profession when its thought seems to be turned very largely to one subject. We have just passed through the porcelain era, and many of the leading journals have been devoting a large amount of space to porcelain. We now have another outburst of enthusiasm on inlays, but this time the enthusiasm is for the gold instead of the porcelain inlay. After the gold inlay has run its course we shall be so familiar with the inlay principle of filling teeth that no progressive dentist should plead ignorance of the subject.

While a great deal has been written on porcelain, many of the writers, through a fit of enthusiasm, have made statements which have caused disappointment to those attempting to follow their teachings. It is probable that those gentlemen who advocated porcelain as a filling material for all cavities, and who suggested that the gold and amalgam pluggers be discarded, to be used no more but to be kept only as relics of barbarism, are finding some use for these instruments today—for we have learned that porcelain should take its place with other filling materials, and not entirely displace them.

NEED OF THOROUGH KNOWLEDGE OF PRINCIPLES AND MASTERY OF TECHNIQUE.

Although many of the journals have been filled with articles on porcelain, it is surprising that such a large number of dentists have no knowledge of the inlay principle of filling teeth. And many are discouraging the use of porcelain because they are not familiar with its good qualities. They may have seen a few failures, and because of these failures and their own ignorance, they are condemning it. Such dentists remind one of the laity who condemn modern surgery because they always learn of failures, but never of the many successful operations. There are others who, through inexperience and lack of knowledge of the principles of porcelain work, have made failures—they also are condemning it; for too many dentists have bought porcelain outfits and attempted the construction of porcelain inlays with but little conception of that which they were attempting.

The construction of porcelain inlays requires precision in each step of the operation. The best work can be accomplished only with a thorough knowledge of the principles of inlay work and the properties of porcelain, with mastery of technique, on the part of the operator.

Porcelain inlays have passed the experimental stage, and their use as an esthetic filling must be more universally recognized. The dentist who fails to master the technique of constructing porcelain inlays will be compelled to refer many of his patients to a specialist in this branch of dental art, for porcelain is the material that should be used to fill most cavities in incisors and canines.

As the size of cavities in vital incisors and canines increases, just in that ratio does the indication for porcelain inlays increase; for if a gold filling is conspicuous at the gingival margin of an incisor

or canine, an approximo-incisal filling is conspicuous to a much greater degree. While there is a limit to the size of an inlay that may be successfully inserted in an approximo-incisal cavity, there are nevertheless too many crowns adjusted on anterior teeth. The ease with which a crown may be adjusted frequently causes operators to overlook the good qualities of porcelain inlays in many large cavities.

Porcelain makes a desirable filling for those approximo-occlusal cavities where the cavity extends too far beneath the gingival margin and involves a large portion of the occlusal surface. In those cases where it is impracticable to burnish a matrix in the cavity, an impression may be swaged of gold 3-1000 of an inch or platinum 1-500 of an inch. If a heavy material is used for the matrix, there will be less danger of warpage during the process of fusing. The matrix, however, should become a part of the inlay. It should be trimmed close to the margin of the cavity after the final fusing, and after the inlay has been set the matrix should be finished to the margins of the cavity at a subsequent sitting. This insures a better-fitting inlay, and one the margins of which are less liable to fracture. There is also less liability of the cement being washed away to any marked degree, for the matrix protects the cement in such a manner that a new washline does not form at those points where the porcelain may fracture at the margins.

While porcelain has the advantage over gold of giving a filling that more nearly harmonizes with the natural teeth, and one that is a non-conductor of thermal and electrical changes, it has still another advantage which should appeal to all conscientious operators, in that imperfect fillings are easily dislodged. A large number of faulty gold fillings which do not preserve the teeth are retained by deep grooves, so that it is almost impossible to dislodge them, thereby deceiving the patient, and many times the dentist. If the porcelain filling is faulty it is dislodged, and the patient knows immediately that the services of a dentist are required.

CAVITY PREPARATION.

It is essential that beginners should understand cavity preparation for inlay work. It is not uncommon for dentists to construct inlays for patients before they have studied the principles of cavity formation. It is not difficult to change the method of cavity formation, even though one has been preparing cavities for gold and amalgam for a long time, if the principles of retention for the different fillings are thoroughly understood.

The preparation of many cavities requires the sacrifice of sound tooth-structure in order to secure the necessary retentive resistance, to prevent frail margins of porcelain, and to obtain proper color. The writer has found in many instances that more sound tooth-structure is involved in the preparation of the cavity for porcelain inlay than would be involved in preparing the cavity for gold. Most porcelain workers are agreed that the cavities should be so prepared that the inlay receives as much retentive resistance as it is possible to give it. Absolute angles, both on the margins and in the cavity, are to be avoided. The cavities should be so prepared that all frail enamel is removed. It should be borne in mind that porcelain is a friable material; this fact is often overlooked, for too often we are careless in our cavity preparation; weak mar-

gins of porcelain are formed, which cause the filling to be imperfect, and all the blame is attributed to the material used and not to the method applied.

MATRICES—MATERIAL AND MANIPULATION.

The selection of material for matrices is partially dependent upon the kind of porcelain to be used and the personal equation of the operator. The writer uses gold for the construction of some matrices for low-fusing porcelain, but he believes platinum to be preferable in most cases. The elasticity of the platinum tends to prevent the distortion of the matrices in the withdrawal from many cavities, and because of the pliability of gold, the matrix will not always retain its original shape in the withdrawal.

The technique of burnishing a matrix is dependent upon the material. If thin gold is used, it should be worked to place with cotton or spunk, and very little burnishing with steel instruments should be done. If platinous gold or platinum is used, most of the burnishing may be done with steel instruments. A piece of foil, large enough to cover the cavity and to be held in position with the thumb and first finger, should be placed over the cavity. Use a ball burnisher as large as the cavity will permit, and work the matrix into the seat of the cavity. After the matrix has been roughly burnished with the large ball burnisher, select a smaller one, and continue the work. Then place a small amount of hard wax or camphor in the matrix and swage it into the cavity. With a piece of tape or rubber dam, turn the matrix over the margin of the cavity. Remove the matrix and trim off the surplus foil, leaving enough material to cover the tooth and to give its contour. Anneal the platinum in the furnace, reinsert the matrix, and re-swage it by filling with camphor or hard wax; then swage it again with tape. If care be taken to conform the metal to the tooth before the final swaging is attempted, an accurately fitting matrix will be formed.

CARRYING THE MENTAL IMPRESSION OF TOOTH-FORM.

Cavity preparation may be thoroughly understood, the technique of matrix formation may be perfected, but until one can carry tooth-form in the mind's eye, one cannot construct inlays in the most artistic manner. Many operators can insert gold and amalgam fillings in such a manner that the lost tooth-structure is replaced with proper contour, but when they attempt to fill a matrix with porcelain the eye and hand do not work in unison, which results in an ill-contoured filling. One requisite of a skilful porcelain worker is the faculty of looking at a matrix and carrying the form of the lost portion of the tooth in the eye. To those who are unable to create a proper mental impression of the tooth-form, I would suggest a thorough course in tooth-carving as being of great assistance. Form cubes or rods of porcelain by mixing the porcelain to a creamy paste with water, and pouring into a matrix made of blotting paper. Then, with proper carving instruments, carve a tooth from the block of porcelain. Another requisite of a skilful porcelain worker is dexterity in handling the matrix and the instruments. Many operators handle matrices as though it were impossible to change their shape. Until one has become skilful in manipulating the matrix after it has been properly formed, one may expect ill-fitting inlays. The matrix should be so

protected and the fingers so guarded that all carving may be done in the matrix without distorting it.

Every porcelain worker is asked, what porcelain do you use? To such questions the writer usually replies by stating that he uses any of them. It makes little difference which porcelain one uses—but one should learn to use porcelain. The difficulty with many beginners is their unwillingness to devote the time to the experimental work which is required to obtain a thorough knowledge of the properties of porcelain. The general principles of manipulating all porcelains are the same. They may be mixed with alcohol, but this destroys their power to be molded and carved. Likewise all porcelains may be mixed with water, and this method insures the possibility of molding and carving.

COMPOSITION OF PORCELAIN.

In order to understand better the properties of porcelain it is necessary to consider the ingredients of which it is composed. Such a consideration shows porcelain to be made up of three classes of substances: (1) Three basal ingredients—silica the oxid of silicon, kaolin the silicate of aluminum, and feldspar the double silicate of aluminum and potassium—which are very refractory substances; (2) fusible substances known as fluxes, which fuse at a lower temperature, and which by combining with the basal ingredients increase the fusibility of these refractory substances, and (3) metals or their oxids, which are used as pigments, and which by combining with the porcelain under intense heat produce the various colors.

Silica and kaolin when heated separately withstand intense heat without undergoing any perceptible change. Feldspar undergoes liquefaction when subjected to a high degree of heat. When feldspar is added to silica and kaolin, the mass undergoes a chemical change which under intense heat causes it to vitrify. The materials commonly used as fluxes to increase the fusibility of porcelain are sodium and potassium carbonate, or some material containing some other salts of sodium or potassium. When any of these materials are added to the basal ingredients, the fusibility of the mass is increased in ratio to the amount of flux added.

It was my good fortune to carry on a line of experiments on the fusing of different porcelains. After making over three thousand experiments, the following deductions were made:

(1) Porcelain has no definite fusing-point.

(2) By prolonging the time of exposure to heat, a thoroughly fused porcelain may be obtained at a comparatively low temperature.

(3) That porcelain fused at a low temperature for a long time will maintain its characteristic color.

(4) That low-fusing porcelains may be made of high-fusing porcelains by repeated fusings and grindings, but the properties are changed.

(5) If a piece of porcelain be thoroughly fused, then heated repeatedly to the maximum fusing-point, it becomes over-fused.

(6) That porcelains containing a large percentage of flux are more easily affected by bubbles than those that are more nearly composed of the basal ingredients, and that they should be heated more slowly.

Although all porcelains have properties in common, there are, however, cer-

tain properties that characterize each manufacturer's product. It is important that these characteristic properties be thoroughly understood in order to obtain the best results.

COLOR.

The power to obtain proper colors in the construction of inlays is a gift that cannot be easily imparted to others. This faculty can be acquired by a thorough knowledge of the principles of color formation and an eye trained to detect the delicate shading of colors in both the natural teeth and in porcelain.

One of the prevalent theories of color formation from pigments, known to artists and colorists, treats red, yellow, and blue as primary colors. According to this theory the many colors used by artists and colorists are produced from these three. When two of the primary colors are combined secondary colors are produced. Red and yellow, for instance, give orange; red and blue give violet, and blue and yellow give green. The excessive predominance of one color over another yields the hue to that color.

By combining the three primary colors so that complete absorption of light takes place, black is formed. The colors produced by the combination of the three primaries are termed tertiary colors. The third primary color, however, does not produce a new hue, but merely saddens the other two by forming a certain amount of gray or black in the combination. They are often called the dulled or broken tones of the primaries and secondaries.

Colors have three qualities, known as hue, purity, and luminosity. The excessive predominance of one color over another yields the hue to that color, and the greater the predominance the stronger will be the hue, *e.g.* when blue and yellow are mixed green is produced; if yellow predominates, the green will have a yellowish hue. The purity of a color is its lack of mixture of white or black or of any color. These admixtures not only weaken the color, but also change its character. This can be shown by adding a white porcelain to a yellow—the yellow is not only diluted, but tends to take a hue. The luminosity of a color is measured by the amount of light reflected to the eye, and is therefore independent of hue or purity. The most luminous color is yellow, while the least luminous is violet; and between these extremes are all the intermediate degrees of brightness. Those teeth wherein yellow and blue predominate appear more translucent because they reflect or transmit the rays; while those in which gray and brown predominate have a somewhat dull appearance, because their power of reflection and transmission of light is not so great, for more of the rays are absorbed on the surface.

In order to become familiar with some of the phenomena of color formation, and to train the eye to detect the hues of colors, the writer finds it both pleasant and profitable to experiment with water- and oil-colors and porcelain. An outfit of water- or oil-colors containing the three primary colors is used. The secondary and tertiary colors with their various hues are produced.

Every porcelain worker should have the colors in porcelain that approximate the three primary colors, and study the formation of colors as applied to porcelain art. While it is impossible to procure pure red, yellow, and blue porcelains, it is possible, however, to obtain colors which when mixed in varying proportions will show the color formation in

porcelain. I have found a special red and blue porcelain manufactured by The S. S. White Dental Mfg. Co., and a yellow by Mr. Robert Brewster, to meet the requirements for this work best of any of the porcelains in my possession.

CEMENT IN RELATION TO COLOR.

That the cement is a factor in the inlay problem is shown by the variation of color so often noticeable when the inlay is set. The inlay may be a good match when the incidence of light is at such an angle as will permit its transmission, but when the angle of incidence is changed, the color of the inlay may change. This phenomenon is caused by the cement—which is an opaque body—excluding the light from the dentin, absorbing certain rays, and reflecting others. And it is the reflected rays that change the color of the inlays.

For small inlays constructed of a monochromatic porcelain, a cement that is of the same color as the porcelain but of a lighter hue is best; for the rays that are transmitted through the porcelain are not absorbed by the cement, but reflected to the surface, with practically no change of color other than that due to intensification. I believe a pure white cement would be the best for setting large approximal and all approximo-incisal inlays constructed of multi-colored porcelain, because white bodies do not absorb light, but reflect it. The same rays that are transmitted to the cement would then be reflected to the surface.

THE FUSING.

The color of the inlay is many times affected by over-fusing the porcelain. It is a fact that over-fused porcelain becomes lighter, and tends to take a glass-like appearance. If porcelain remains in contact with the maximum heat long enough, or if it is brought to the maximum fusing heat by repeated fusing, it tends to form a glass-like mass. All the hues of a color, from the normal to a light one, may be made from the same porcelain by increasing the heat above its maximum fusing-point—but this is done at the sacrifice of its strength. In applying the enamels over the foundation, each layer should be fused only to a high biscuit, heating the enamels to the point of glazing only at the final fusing. This prevents over-fusing the first layers.

I wish to condemn the method of fusing porcelain at its maximum temperature for a short time. It makes the porcelain more brittle, and causes the formation of minute bubbles throughout the mass. I also wish to protest against placing the porcelain in an intensely hot furnace, for it causes a crust to be formed on the surface, which prevents the escape of gas. This gas will seek the point of least resistance, which will be along the margin, and result in the formation of bubbles along the margin of the inlay.

If porcelain art is to maintain the high place in the dental art that its advocates are claiming for it, it must be treated as an art. And those who practice this art should acquire a thorough knowledge of the subject, in order that this knowledge may be placed in proper action.

Discussion.

Geo. T. Banzet, Chicago, Ill. My first desire in opening the discussion of Dr. Byram's most excellent paper, is to compliment the essayist upon his noble creation.

However, those who know Dr. Byram,

and know of the great amount of work which he has done, both in his practice and experimentally, conducting as he has over three thousand experiments on the fusibility of porcelain, would expect no less able an effort from such an enthusiastic and conscientious scientist. It is a genuine pleasure to discuss this paper, and to endeavor to bring out some points which the essayist has not particularly dwelt upon. I wish to emphatically approve of his position when he states that porcelain should take its place among the other filling materials and not be used exclusively. I have had sufficient experience with porcelain to know absolutely that it cannot be used in all cavities without a great and unwarranted waste of tooth-structure, and no one can practice dentistry conscientiously who confines himself to porcelain alone as a reparative material.

It is unfortunately true that many are discouraged, some by observation of work which in the beginning was not perfect, and others because they had not perfected themselves before taking up this line of work. The latter condition is particularly deplorable, because it is extremely difficult to convince these individuals that they themselves, rather than the method, are at fault. Experimenting in this work must be done; no one can escape it. The question therefore arises, Shall the experiments be conducted on models outside of the mouth, and where your failures will bring no humiliation; or will you "try it on the dog," and thereby lose perhaps some of your best patients, and your past reputation for skill and progressiveness? Knowledge of the technique and properties of the various porcelains and metals to be employed as matrices, as well as manipulative skill, can be obtained by experimenting on models better than in any other way. It is true that failure of an inlay in contradistinction to that of a metallic filling can be easily determined. Recurrence of decay, which is very rare, can only occur at the margins, and here it is easily discovered and remedied. It is also true that many crowns are inserted when it could be obviated by the use of inlays.

Porcelain is the ideal filling material for all cavities which are not subjected to masticatory stress, for the reasons which the essayist has advanced, namely, freedom from thermal and electrical action, esthetic appearance, and because of its highly glazed surface, which inhibits to a greater extent than any other material the retention of food débris. For all buccal, lingual, and compound cavities where the margins are not in danger of fracture, as well as for the anterior teeth, I would most heartily recommend it. Cavity preparation must be carefully studied, and for this the work on the models will be the most beneficial.

I wish to take issue with the essayist when he declares that "absolute angles both on the margins and in the cavity are to be avoided." The more nearly absolute are the angles in a cavity, while still permitting the withdrawal of the matrix without distortion, the less will be the liability to dislodgment, the more accurately will the inlay go to its place when set, and the greater the force which it will be possible to use to expel the excess cement. The margins should be almost at right angles to the adjacent tooth-surface, as this form will permit of the use of the great degree of force necessary in order to accurately burnish the matrix, and will obviate the formation of frail margins and friable inlay edges. The vast majority of inlay operators have a

horror of getting folds of the matrix on the margin. This, however, is of absolutely no consequence.

Many talk at great length on cavity preparation, and then, in their anxiety to prevent folds on the margin, tear the matrix so badly that they cannot secure perfect adaptation to the walls of the cavity, thus defeating the object of their careful preparation. If the margins have been properly prepared at nearly right angles to the adjacent surfaces, the matrix can be perfectly adapted to the walls of the cavity, and then if folds occur on the margins they can be readily burnished down to the same thickness as the remainder of the matrix without the slightest danger of fracturing the margins; in addition to which the folds will very much stiffen the matrix. I almost invariably use platinum for the matrix, as I prefer the high-fusing bodies. There is very little danger of distortion in carving or fusing if care be used. I find that a solution of shellac, painted just inside the margins at certain points, will to a great extent obviate distortion in fusing.

I cannot believe that there is greater loss of tooth-structure in preparation for inlays than for fillings. At times there is an apparent loss, but it is always in a position where it will not weaken the tooth. I have many times retained the labial enamel plates of the incisors and canines, reinforcing them with porcelain inlays, where they could not possibly have been safely retained in any other manner. It is essential to be able to carry the tooth-form in the mind, otherwise it will be necessary to place the unfinished inlay in the cavity after each fusing in order to be sure of the proper contour, as all grinding after the inlay is set should be avoided. Water should always be employed to mix the porcelain, and as little as possible, care being taken to absorb all that may remain in the matrix before fusing. This can most easily be accomplished by bringing the porcelain in the matrix into contact with the dry powdered porcelain which you are using, and then removing it with a brush. I have recently been using a foundation body which matches the tooth to be restored as nearly as possible, and then finishing the inlay with the enamel bodies. My usual practice is to employ Whites' bodies—the fusing-point of which is above that of Brewster's foundation bodies—for the foundation, and to finish the inlay with Brewster's enamel and finishing bodies, care being observed not to carry the porcelain to a full glaze except in the last fusing. I prefer hydraulic cement for setting the inlay, as thereby the saliva may be allowed to reach the inlay within two or three minutes, thus conducing much to the comfort of both patient and operator, with the consequent saving of time, as some other operation may be carried on while the cement is crystallizing.

In closing, I wish to indorse what the essayist has to say regarding porcelain art, for unquestionably it is an art to be able to so restore decayed or broken teeth that the filling or inlay will not be perceptible; and it is only by thorough and conscientious work that one can acquire the knowledge sufficient to secure such results.

Dr. H. H. Johnson, Macon, Ga. The paper is a most valuable one, and I think it comes nearer to covering the subject completely than any paper on porcelain inlays I have ever listened to. It shows that the writer is a keen observer, and that he has had vast experience in this work. There are just one or two points on which I would like to speak; one is

that he cuts the overlapping margins of the matrix entirely away. I have found that the matrix has greater rigidity and is easier to be kept in shape where the overlap is left quite broad, so that it can be handled with greater carelessness, so to speak, without danger of changing its shape during the process of introducing the porcelain into position.

The allusion to cementing the inlays into place without removing the matrix reminds me of my early experience in porcelain work. In 1893, or about that time, Dr. Downie introduced his little gas furnace, and I made some inlays with it at that time. I cemented these into place without removing the gold matrix, and I do not know whether this was not the reason for these imperfect fillings having lasted as long as they did. I placed several dozens of these fillings in the mouths of patients about that time, and of these I have had four under my observation until last year, when three were removed by Dr. Hinman—one of them being still good—and replaced with much nicer fillings. Of course I believe that at this time I can do more perfect work myself, because we have better materials; but these imperfect fillings did preserve these teeth for twelve years, although the work was imperfectly done, because both the furnace and the porcelain used at the time were imperfect. I simply allude to that because the essayist had something to say on that subject.

He also says that either high-, low-, or medium-fusing bodies will do, according to the preference of the operator. I differ with him in that respect very materially, as I think that the low-fusing bodies are exceedingly preferable—the lower the better. If I can find any porcelain that will fuse lower than the ones I am now using I will adopt it. I prefer such for the reason that delicate colors are very prone to be changed by heat, and are very easily bleached out. It becomes necessary often to bake an inlay three or four times, and in doing so, the color of the porcelain, especially of the high-fusing one, is continually bleached out. He says, further, that a low degree of heat continued for a long time will not alter the colors. There I differ with him again, for I am aware that a low degree of heat if continued beyond a reasonable length of time does change the color of the body. To succeed, at least in so far as color is concerned, I find that it is necessary to remove the inlay from the furnace just as quickly as possible after the fusing takes place; and I also find when using low-fusing bodies that it is best to have the furnace heated to the required fusing-point, and when ready, to slip the inlay into the furnace and watch it until the fusing takes place, and then immediately remove it. In this way one is less liable to burn out the color of the porcelain. I have had much greater success since adopting this plan.

The art of making inlays, because it is an art, will probably never be successfully done by the average operator. It is now being used quite generally over the country, probably more generally than the essayist thinks, but there will only be a few, a very few, in the profession who will ever attain anything like perfection in this work. The reason for this is very plain, as a greater knowledge of art is required to mix colors accurately than is called for in any other branch of dentistry. The art of color-mixing also extends to the cement question. You may make a perfect inlay, place it in the tooth temporarily to try it, and probably you will hardly be able to discern it at all. Now mix the cement and place the inlay again

in the tooth, and you will find that it is considerably off color. So that one not only has to contend with the color problem in mixing the porcelains, but also in mixing the cement.

Dr. F. E. Roach, Chicago, Ill. I do not know that I have much to say on this very excellent and timely paper by Dr. Byram, for the reason that I cannot disagree with him on any point. What I do say will be to further emphasize the good points brought out by the essayist. Knowing him as I do, and the successful work he has done in porcelain, coupled with my own experience and observation, I am prepared to indorse all he has said.

I do not think that there is any question at this time as to the inlay being an established part of dental practice—the inlay in some form. We must accept it as a feature of our practice. While many of us may not adopt porcelain, I feel that there is a field for the inlay method of saving teeth in some of its phases—either the porcelain or some form of gold inlay. We hear occasionally that the popularity of the inlay is on the wane, and that it is soon to be laid on the shelf with other fads. I regret very much to hear Dr. Johnson throw out the discouraging remark that it is only for the few who are skilful—for the man who has the delicacy of touch or the ability to acquire this delicacy of manipulation—to use porcelain as a filling material. I most emphatically disagree with Dr. Johnson in that respect.

Dr. Johnson. I did not mean to say that the average operator would not be able to manipulate porcelain successfully so far as making a fit and preserving the teeth are concerned. What I said was in regard to the artistic and esthetic phases of the work, and if I failed to make that point clear it was through oversight.

Dr. Roach. Dr. Johnson's remark that it requires unusual skill to make porcelain inlays is wrong. I believe that the average operator can acquire the skill to make a tooth-saving porcelain inlay as easily, if not more easily, than he can acquire the ability to insert a tooth-saving gold filling. Experience in teaching porcelain, both to the practitioner and to the student, justifies my belief that the inlay technique is as easily mastered as that of gold fillings. We do not make perfect inlays every time; neither does the gold operator put in a perfect gold filling every time. And so I say it is wrong to discourage men who are taking up this work. Of course you will have failures, but that does not mean that you do not possess the needed ability. We have not hitherto had the teaching requisite upon the subject of inlay work. It is just in its beginning; we are learning how to make inlays; we are just getting at the first principles. How many will agree on the question of cavity preparation? Some ten years ago Dr. Black gave us a systematized method of cavity preparation for metallic fillings based on scientific principles. We are far from that for inlays, but we are getting together as we are going farther along the line, and eventually we will have a system of cavity preparation; and when we arrive at such a systematized plan there will be no occasion for the claim that men are not able to acquire sufficient skill for making inlays. I have been an enthusiast on this subject for several years and as time goes by I become still more enthusiastic.

I had the temerity two or three years ago, in a paper read before the Northern Indiana Dental Society, to predict that the inlay system would be the method of

filling teeth in the future, and I am more strongly of that conviction today than ever. I have never said or believed that gold and amalgam will be laid aside, but I do believe that filling work, in the case of the large majority of cavities that come to us, will in the future be done by some form of inlay. I believe that the man who is not yet practicing the inlay method is doing himself and his patients a great injustice, and the sooner he adopts the inlay method in some of its forms the sooner he will save himself a great deal of hard work, and his patients a great deal of inconvenience; and he will accomplish, I believe, better results.

Now with regard to the fundamental principles of cavity preparation for inlay work. While the difference in cavity preparation for inlays and that for metal fillings is not wide, the principles are practically the same. We must have free access to the cavity; we must have good solid walls, and if anything we go the gold operator one better in the practice of extension for prevention. For, as the paper says, in proportion as the size of the inlay is increased, its strength will be increased. And so we must learn the very first lesson, and that is cavity preparation. Free access from every angle, sharp margins, slightly diverging walls, and extension for prevention, if you please. Then we come to the rules of retention. The idea has prevailed, and still prevails, that we must depend upon the cement to hold the inlays in position. That I contend has led many men to failure and discouragement. They depend on the adhesion of the cement to retain inlays in shallow cavities. I maintain that all cavities must be so formed that the adhesion of cement will be supplemented by mechanical retention. My opinion is that ninety per cent. of the cavities prepared for inlays may be so shaped that frictional resistance will be the means of retention. Just what I term frictional resistance is this: Take for example the builder's lap in the placing of brick; one brick overlaps one-half of the adjoining brick, so that when the joint between each brick is luted with mortar a very powerful frictional resistance is offered against lateral displacement—that is the form of retention in a majority of inlays. In the case of cavities subjected to considerable strain we must resort to some more positive means of resistance, and that may be accomplished either by pins or by so shaping the cavity that some point or some surface of the tooth will act as a positive plane of resistance in the direction in which the inlay is most likely to be dislodged.

I would call your attention especially to one point brought out in the paper, and that is in regard to the fusing of porcelain. There is no question in my mind at all that Dr. Byram is absolutely correct in the statement that with too many inlay workers there is a tendency to fuse the porcelain too rapidly. The very best inlay will be obtained by fusing the porcelain at a low heat for a long time. The great number of experiments I have made in my own experience thoroughly and absolutely corroborate this statement, and I want to emphasize this point. The practice I have frequently noticed, of placing a piece of porcelain in the furnace at the maximum heat and attempting to fuse it in a few seconds, is wrong. In that way the porcelain is broiled, and not baked.

There are five factors that enter into the scheme of matching the color of the tooth that one is operating upon, and these five factors are proper fusing,

thickness of the layer of porcelain, the underlying colors, the modification of the colors by the cement, and the shadow problem. I find in my teaching of the selection and matching of colors that if I can get the student to bear in mind these five factors the results will be very much better.

There is much more that I might say on the paper, as it is one in which I am deeply interested, but I shall take no more of your time than simply to say that I want you to take it home and digest it—for anything that Dr. Byram writes you can well afford to study at your leisure moments.

Dr. H. L. Ambler, Cleveland, Ohio. There has been quite a contrast drawn between porcelain inlays and gold fillings by the speaker who presented the porcelain subject, and I wish to contrast the two for just a moment. In 1864, before this association, the statement was made that no preparation of sponge or crystal gold would ever displace gold foil. I desire to make the statement here today that no preparation of porcelain for inlays will ever entirely displace gold foil. I have great respect for those who have developed the electric furnace, and who have spent much time in developing porcelain inlays. I admire the cosmetic effect of such inlays. I have a Custer furnace—the first one invented—and I sometimes make porcelain inlays. Dr. Roach has said that he believed porcelain inlays, in the majority of cases, would displace all other filling materials. It is my opinion, after forty years in the profession of dentistry, that no young man within the sound of my voice will ever live long enough to see gold, gold and platinum in combination, tin, and amalgam entirely displaced. There are a great many men who can make a porcelain inlay. They can make a matrix fairly well; they can fuse the porcelain fairly well—I do not dispute that—one speaker said so, and I agree with him; but the great trouble with the majority of porcelain workers is that while they often make a fair inlay, when they set it in the cavity it is a failure. I believe we are making too many porcelain inlays today. I practice in Cleveland, which is a fairly large city, and I have seen there some inlays—inserted by operators in larger cities than Cleveland—that came right out of the teeth, and I know that some of these, although they had been made according to correct technique, had to be replaced by gold fillings. When you come to contrast the edge strength of the inlay with that of a gold filling, it is not to be mentioned in the same century. Especially is that true with incisal and occlusal fillings. I want to go on record, as I stated in the first place, as believing that the time will never come when our other good filling materials will be entirely displaced by porcelain. I do not wish you to think that I am decrying porcelain. It is all right in the right place, but it should not be placed in cavities improperly prepared to resist the mechanical forces brought against it.

Dr. Roach. Dr. Ambler misunderstood me when I said I believed the inlay method would eventually supplant other methods of filling teeth. I did not say porcelain inlays entirely, and I would like to make that modification of my statement. I do not think that porcelain inlays will supplant other filling materials by any means, but I do believe that inlays—the inlay method—will be the most popular method in the future.

Dr. L. E. Custer, Dayton, Ohio. I would like to add a few points, one with regard to the idea of quick-fusing porce-

lain. There has been a demand for quick-fusing porcelain, and we have been in the habit of trying to fuse it too quickly. That is all wrong, as pointed out in the paper, because during the time of fusing porcelain there is a chemical process going on, and it takes a certain length of time for this to take place, and thus give us a homogeneous mass when completed.

I do not think, as Dr. Ambler seemed to think, that the size of the city has much to do with the perfection of porcelain work. The most beautiful work of this kind I have ever seen had been made by a practitioner in a town of about twenty thousand people.

On motion Section I then adjourned to meet again at a later session.

SECTION I—Continued.

SECOND DAY—Thursday, September 20th.

The second meeting of Section I was called to order at 9 o'clock Thursday morning, September 20th, by the chairman, Dr. Burton Lee Thorpe.

The first order of business was the reading of a paper by Dr. V. H. Jackson, New York city, on "Orthodontia: Opening the Bite in the Regulation of Teeth: A Metal Flange for Improving the Anchorage of Appliances, for Moving Teeth, and for Harmonizing the Occlusion," as follows:

Orthodontia: Opening the Bite in the Regulation of Teeth: A Metal Flange for Improving the Anchorage of Appliances, for Moving Teeth, and for Harmonizing the Occlusion.

By V. H. JACKSON.

In the practice of orthodontia, cases are presented with irregularities of the teeth in which the abnormal occlusion requires the opening of the bite for their correction; that is, some of the teeth that should have a labial occlusion have a lingual occlusion, or the reverse, being interlocked by the teeth of the opposite arch. In some instances the movement of these teeth, in their correction, is greatly facilitated by opening the bite so that they will not be interfered with by the teeth of the opposite arch during their movement.

Of the large number of cases of irregularity of the teeth treated, but a small percentage require the appliance to be arranged to open the bite for their correction.

When the jaws are at rest the teeth are not in occlusion, the full occlusion of the teeth taking place only at the time of mastication, during the act of swallowing, during extreme muscular or physical strain, while enduring pain, and at times during sleep, when suffering caused by some nervous disorder prompts the gritting of the teeth.

The opening of the bite is the operation which consists in the placing of an object between the upper and lower teeth at the most favorable location, so that the teeth of the arches cannot occlude. The advantage of this practice has been recognized for a great many years, and numerous efforts have been made to construct an apparatus for opening the bite that could be easily applied and retained, and at the same time be of service to the patient during the function of mastication.

With the early methods of opening the bite, blocks of ivory, gold, or silver were employed by being placed between the occlusal surfaces of the teeth, and usually by tying them to those of either the upper or lower arch; gold caps, and sometimes plates of gold or silver, were fastened to the occluding surfaces of the molars or bicuspids. Later, vulcanite in the form of a plate, with the sides raised as required, was used for this purpose, the thickened part being made to extend over the grinding surface of the teeth to occlude with those of the opposite arch, as illustrated by the Coffin method.

Fig. 1.

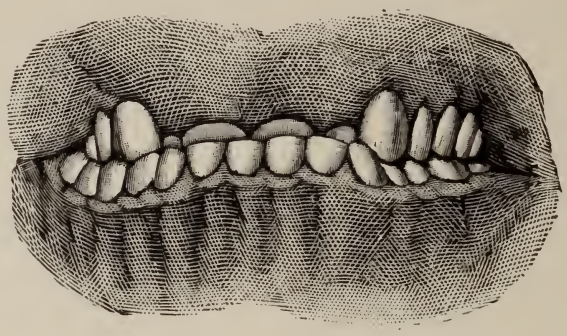
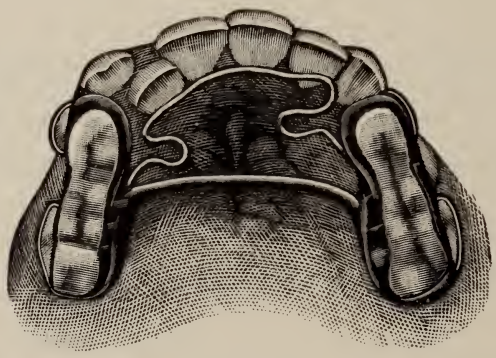


Fig. 2.



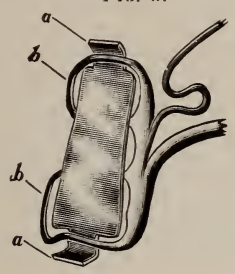
The opening of the bite is more commonly employed for moving upper incisors from a lingual to a labial occlusion, or lower incisors from a labial to a lingual occlusion.

Fig. 1 illustrates a case in which the upper incisors closed back of the lower ones to such an extent as to require the opening of the bite to facilitate their outward movement.

An appliance for moving the incisors outward, and at the same time open the bite, was made as illustrated in Fig. 2. The appliance was removable, made on a plaster cast in the usual manner, with partial clasps, spring clasps, base-wire, and a semicircular spring with U-shaped loops. The spring clasps are passed over the first bicuspids and first molars for anchorage.

The opening of the bite can be begun at any stage of the regulation of the teeth

Fig. 3.



at which it is found necessary. For this purpose the appliance is adjusted on the cast, and a strip of plate metal, No. 36 gage or thinner, is placed across the teeth from before backward. (Fig. 3.) The metal is fitted into the depressions of the teeth as well as may be by successively pressing it gently with a piece of wood, ivory, or a metal instrument, and it need not necessarily be swaged. The ends of the plate metal are then narrowed with the scissors sufficiently to permit one end to be passed underneath and doubled around the mesial wire of the spring clasp on the bicuspid, and the other around the distal wire of the spring clasp on the molar. Wax is then built up on this part, and the appliance is inserted in the mouth for the purpose of securing the bite, and at the same time to determine how much the upper and lower arches should be separated to permit the upper incisors to be moved outward without interference. The appliance is then replaced on the cast, the edges of the wax trimmed smooth, and moldine pressed over it to form a mold. The moldine is taken off to remove the wax, and replaced, with a hole left in the side. Chemically pure tin or jewelers' soft solder is melted in an iron spoon and poured into the mold. This forms a block of metal on the appliance in the space previously occupied by the wax, causing a good articulation with the lower teeth.

Another method, that is usually preferred, is to build up the raised part by flowing on the plate metal jewelers' soft solder or pure tin, using the soldering iron, after placing a piece of properly shaped moldine around this part of the appliance to form an outline. The surface of the solder is then dressed with a coarse file, and the parts properly finished and polished; or a bar of metal can be soldered to the plate metal and dressed to form a good occlusion.

The upper incisors are moved outward with the looped spring in the usual manner, as shown in Fig. 2, and when they have passed sufficiently in front of the lower incisors the metal is dressed away from the grinding surface from time to time as much as the position of the incisors will warrant, until it is all removed, which leaves the appliance free, as ordinarily made, permitting the teeth to rest together in occlusion. The same appliance is used for retaining the teeth when desired.

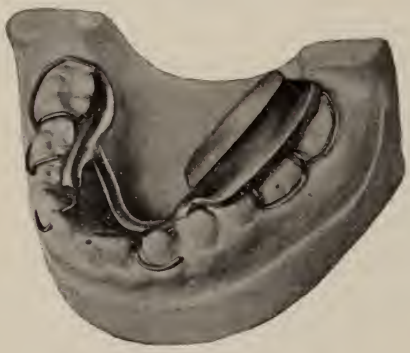
The opening of the bite in this manner, when not excessive, does not interfere with mastication or with speech, the appliance is inconspicuous, is suitable for any age, and for the correction of any form of irregularity requiring the opening of the bite. A few important cases will now be described and exhibited.

Fig. 4 illustrates a case of unilateral occlusion in a boy aged ten years. The

Fig. 4.

upper arch was of good form, excepting that the incisors were very prominent, with slight spaces between them, and resting over the lower lip. The lower

Fig. 5.



arch was narrow, the incisors extruding and apart from one another.

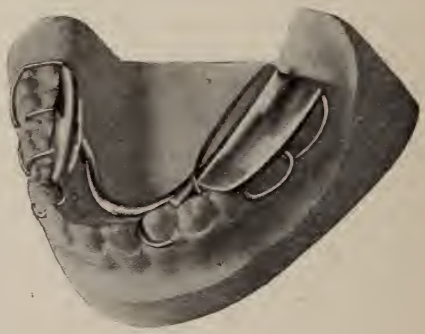
The occlusion of the deciduous and permanent molars on the left side was good, while on the right side, the lower arch being narrow, there was an entire lack of occlusion, the lower teeth closing inside of the line of the upper ones. From lack of use, the molars on that side had become somewhat elevated in their sockets, causing the upper teeth to lap outside the lower ones to such an extent as to cause a wearing down on the sides where they rested together. This lapping of the teeth prevented the regaining of a natural occlusion without mechanical interference.

With these conditions present, it would be useless to apply simple force for the expansion of the lower arch without opening the bite, as any force applied for moving outward the lower right molars would also move the upper molars

Fig. 6.

outward more or less through the occlusion, and the same force, if continued, would move the teeth of the left side of the arch outward, spoiling the good occlusion which existed on that side. To overcome these conditions, an apparatus was

Fig. 7.



constructed as shown in Fig. 5. The usual appliance with a lingual base-wire for expanding the lower arch was first made. The bite was opened by

building up with metal the anchorage portion of the apparatus on the left side sufficiently to permit the elevated molars on the right side to clear. In addition to the built-up portion on the left side a metal flange was attached to it for increasing the anchorage. The flange was made of plate metal No. 22 gage, and soldered to the lingual side of the anchorage portion of the appliance extending from front to back, projecting upward about three-sixteenths of an inch, and fitting the palatal faces of the upper molars. Opening the bite in this manner prevented the locking of the teeth on the right side, and the flange resting on the lingual faces of the upper molars in occlusion prevented the position of any of the teeth changing on that side as pressure was applied by the spring base-wire in forcing outward the teeth on the right side. (Fig. 6.)

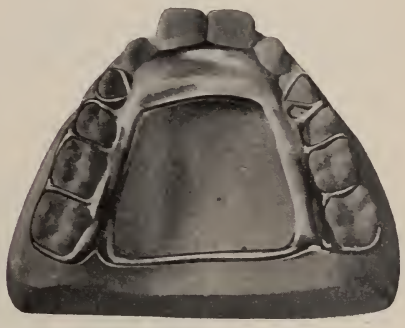
The expanded condition of the arch and the same appliance after twelve visits is shown in Fig. 7, the patient calling at intervals of not less than one week.

The arch being expanded sufficiently, the flange and the metal block for opening the bite were removed, permitting the teeth on the right side of the arch to rest in occlusion with the teeth of the upper arch, and the same appliance for retaining was continued in use.

The upper incisors were much too prominent and needed to be moved inward, but as the lower incisors naturally antagonized with the gum back of them, their position could not be corrected until the lower incisors were depressed in their sockets. This was accomplished by an appliance adjusted in the upper arch, as illustrated in Fig. 8. It was made with a palatal base-wire, and anchored to the teeth by partial clasps and spring clasps in the usual manner. A semicircular spring with U-shaped loops was arranged to cross the labial faces of the incisors, with the ends, one on each side, passing over the arch at the junction of the canines with the first deciduous molars, to be united with solder to the anchorage portions of the appliance.

To the anterior part of the appliance, back of the incisors and canines, was attached a semicircular piece of plate metal about No. 22 gage, forming a table, resting high above the gum. This opened the bite by directing all of the force of occlusion on the lower incisors, gradually depressing them in their sockets. The table was sustained and prevented from pressing against the gum during occlusion by two small wires—

Fig. 8.



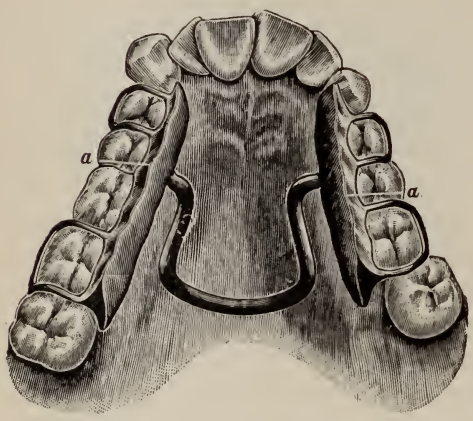
each curved into a small loop, the end of the loop being bent upward and hooked over the canine—one on each side of the arch, with the ends soldered to the table and anchorage.

As the lower incisors were depressed in their sockets, the anterior part of the metal table was dressed away a little from time to time, and the loops of the semicircular spring were closed slightly for forcing inward the upper incisors.

Care should be exercised in not causing too much force on the semicircular spring at one time. The anterior edge of the table should be dressed away a

little in advance of the movement of the teeth. The only exceptions to this are when the teeth are to be rotated, or when

Fig. 9.



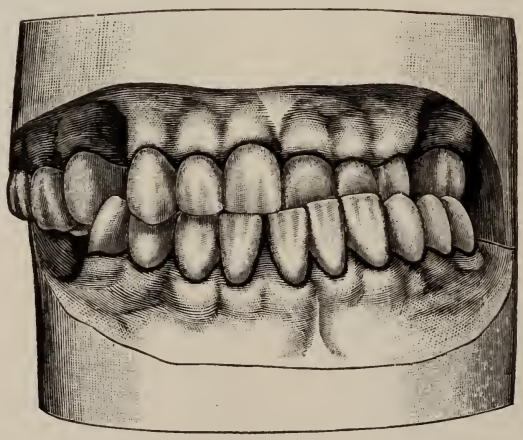
they require to be depressed in their sockets.

The table is sometimes arranged to tip forward in order to form an inclined plane for forcing the lower incisors outward at the same time they are being depressed, or tipped backward for forcing the lower incisors inward as they are being depressed.

An apparatus with a flange, as described in connection with Fig. 5, is utilized in my system for many purposes. In expansion of the arch when the teeth are to be moved to a considerable extent, it is sometimes difficult to harmonize the teeth of the upper arch with those of the lower to establish a good and permanent occlusion. Fig. 9 illustrates an expanding and equalizing device adjusted in the upper arch, with flanges attached on each side projecting downward from the lingual surface. The appliance is made with partial clasps and spring-clasp attachments, connected by a large palatal base-wire. Spurs are extended from the device to the grinding surface of the upper teeth, in order to prevent the apparatus from being pressed against the gum.

The flanges, *a, a*, are made of heavy plate metal, and shaped to project sufficiently on the lingual surface of the lower molars, bicuspids, and canines in occlusion, to guide and cause them to articulate with the upper ones. In locating the flanges on the appliance it is well to take a bite as for making artificial teeth. Their general contour can

Fig. 10.



be crimped to fit the lower teeth, or left smooth. When it is not desired to change the shape of the flanges they can be thickened with solder. Bending outward the base-wire slightly from time to time broadens both the upper and lower arches. The flanges can be bent outward or inward, as required, to further adjust the occlusion. When desirable, the flange can also be extended around the anterior part of the arch, as for correcting a receding mandible. For some conditions the flanges may best be made to project in the form of independent flat metal springs. This device is applicable for similar purposes in the lower arch in conjunction with the lingual base-wire. It seldom interferes with mastication. The appliance can be removed by the patient for cleansing it as would any other ordinary appliance.

Fig. 10 illustrates the position of the teeth of a patient forty-one years of age.

Fig. 11.

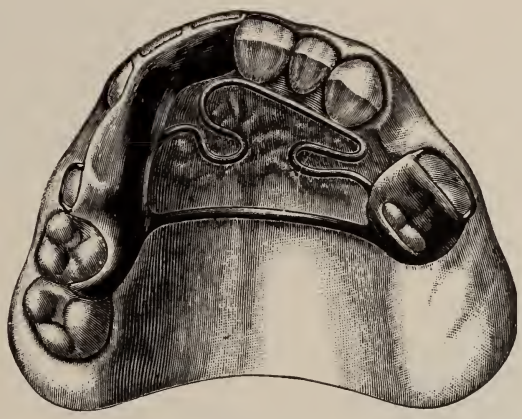
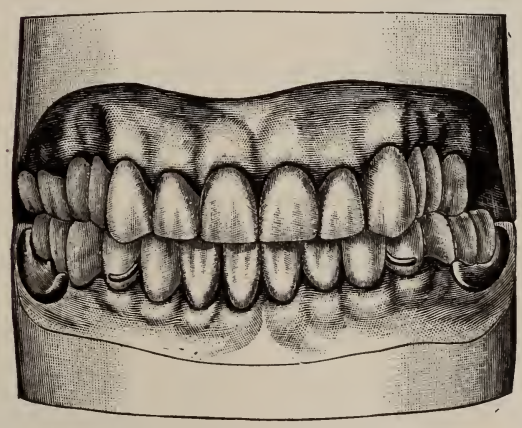


Fig. 12.



It was a case of unilateral prognathism, in which the opening of the bite was necessary for its correction.

The left upper canine and the central and lateral incisors closed far inside of the lower teeth, the lower canine and incisors projecting nearly to the upper gum in front of them, and some of the teeth were considerably worn down. Several

molars and bicuspids of the upper and lower arches were absent, making it somewhat difficult to secure a good anchorage for the correction of the irregular teeth. A device was arranged to open the bite, in order to thus facilitate the movement of the irregularly placed teeth, and at the same time to secure additional anchorage by making possible the attachment of the appliance to the upper incisors and canine on the opposite side of the arch. A spring-clasp attachment was arranged over the upper left first molar, the only remaining anchorage tooth on that side, and a spring-clasp attachment over the upper right second bicuspid—the first bicuspid having been removed—with partial clasps on the first molar, canine, lateral and central incisors. (Fig. 11.) Small short wires were shaped to pass over the incisal edge at the junction of the central incisors, lateral, and canine, resting on the partial clasps, with the ends on the labial side extending perpendicularly toward the gum to assist the anchorage and to prevent the appliance from being dislodged during mastication.

The sides of the device were connected by a palatal base-wire. A semicircular spring with two U-shaped loops was arranged with the ends extending to the anchorage portions. All of the parts were united with solder. The bite was opened by building additional solder on the partial clasps on the incisors and canine, which had been left unusually broad, and on to strips of plate metal, one extending from the canine across the space and over the bicuspid, and the other over the molar on the opposite side of the arch. The bite being opened in this manner did not interfere with mastication, and permitted the outward movement of the instanding teeth when force was applied by means of the looped spring. The anterior part of the spring was retained by a lug on a collar cemented to the canine. The regulating was completed in a limited time and with no special discomfort to the patient. In Fig. 12 is seen the position of the teeth, and the partial upper and lower plates, which served for retaining the teeth and which filled the vacancies in place.

Fig. 13 illustrates the case of a patient thirteen years of age. The teeth were very large, and the cheek bones prominent. The upper arch was broad, and the incisors tipped inward. The lower arch was narrow, the molars on the left side and the second molar on the right side closing entirely inside of the line of the upper ones. The incisors were extruded, antagonizing against the gum back of the upper incisors. As the patient lived in central New York, and required eight hours' time to reach my office, he could therefore make visits only at long intervals.

The lower arch was first expanded laterally with an expanding device as shown in Fig. 14. The appliance was anchored by partial clasps and spring-clasp attachments to the bicuspids and first molars. The anchorage portions were connected by a lingual base-wire, which passed below the gum line, and extending backward, entered the anchorage from below upward. The base-wire, entering the center of the anchorage portion in this manner, permits of its being utilized for the expansion of the whole arch laterally, or for the lateral expansion of the distal or anterior portion of the arch as required. The base-wire extending far back on each side to enter the anchorage, also has the advantage of the lengthened arms, as it is thereby rendered more springy and generally more effective in expanding laterally the anterior part of the arch.

The second molar was badly tipped within the arch, and just erupting. In such a case it is generally found an ad-

Fig. 13.

vantage to move the teeth outward by a spring rather than by the general anchorage with partial clasps. The spring is attached in the anchorage portion of the appliance in front of the irregular tooth, and is made to extend backward, following the gum line to the distal part of the molar to be moved, where it is bent forward on itself to form a loop, with the end resting on the grinding surface. A spring of this shape will not slip toward the gum as force is applied for moving the tooth outward.

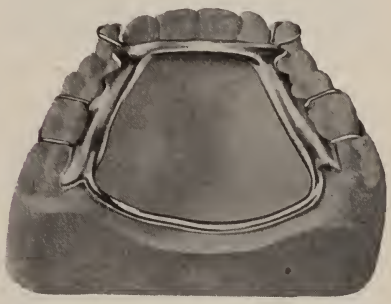
When the arch was expanded sufficiently, the lower incisors were depressed

Fig. 14.

in their sockets through the force of occlusion and by means of an appliance worn in the upper arch. (Fig. 15.) The appliance was made with a palatal base-wire anchored in the usual manner. To the anterior part of the appliance back of the incisors was attached a semicircular piece of plate metal, similar to the one described in Fig. 8. It was arranged to incline forward, and was supported against the upward thrust of the lower incisors by two small loops of spring wire, arranged to hook over the cusp of each of the canines. The ends of the wire extended below the table to which they were soldered.

Underneath the table and resting near the gum were two finger springs for moving the upper incisors outward. They

Fig. 15.

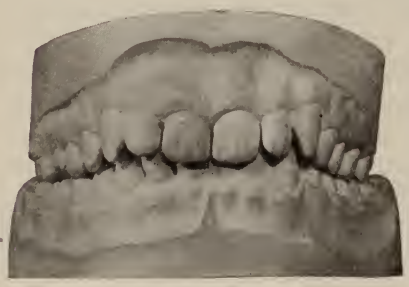


were soldered to each side of the anchorage portion of the appliance, and made to extend forward in the direction of the lingual faces of the incisors to the opposite side of the arch.

When the lower incisors were sufficiently depressed, the finger springs were bent forward slightly from time to time, in order to move the upper incisors outward (Fig. 16), after which the upper and lower arches were equalized to improve the occlusion. The same appliances were used for equalizing the jaws. For this a wire was extended from the anchorage portion of the upper appliance on each side of the arch, passing over

the occlusal surface at the junction of the lateral incisor with the canine to the gum line, where it was soldered to a narrow partial clasp resting in front of the canine; at the same time a wire hook was attached to the partial clasp for

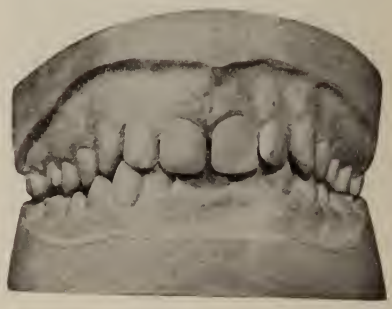
Fig. 16.



holding one end of a rubber equalizing band. The other end of the equalizing band was supported by a similar hook attached to the distal part of the apparatus on each side of the lower arch. When the apparatus is not well retained by the spring-clasp attachments, it is an advantage to cement to the last lower molar on each side of the arch a collar with a small lug on the bucco-distal surface, and attach to the anchorage portion of the appliance a wire clasp, so shaped as to pass back of the molar from the lingual to the buccal side, resting under the lug, the spring terminating in the form of a hook. (*Dental Cosmos* for 1906, vol. xlviii, p. 282.) Fig. 17 illustrates the present condition of the occlusion, the regulating not yet being completed. Six visits were required for adjusting the apparatus to bring about these changes. A local dentist under my direction added force by bending the springs occasionally.

Fig. 18 illustrates an appliance used for depressing the lower incisors, and moving outward the upper incisors for a patient sixteen years of age. The appliance was similar to the one last described. The upper and lower first bicuspids had been injudiciously removed by another practitioner. The features were not sufficiently prominent, requiring the

Fig. 17.



incisors and canines of both arches to be moved forward, and the spaces artificially filled.

I have used apparatus for opening the bite in a variety of cases, but owing to lack of time, will merely mention one or two additional cases.

Fig. 18.

Miss S., fifty-one years of age. (Fig. 19.) The early regulation of the teeth had been neglected, and an extreme prognathous condition had resulted, the lower incisors biting near the gum in front of the upper ones. The bite was opened and

the lower incisors were moved backward, after which a chin-cap was applied to force the jaws together and to adjust the occlusion. (Fig. 20.)

Mrs. M., thirty-six years of age. An appliance was inserted in the lower arch to open the bite and move the incisors inward, and another one inserted in the upper arch for moving the incisors and canines outward.

Another similar case, that of a girl thirteen years of age, is illustrated in Figs. 21 and 22.

In concluding my paper, I will briefly describe an interesting case of prognathism in a child aged two years and ten months. (Fig. 23.)

The mandible was very prominent, the incisors and canines touching the gum in front of the upper ones when in occlusion. The upper incisors needed to be moved outward, requiring the opening of the bite. The irregularity was successfully corrected by the application of a small metal inclined plane. The inclined plane pointing backward was attached to the incisors and canines of the lower arch. (Fig. 24.) This had the effect of opening the bite and at the same time of forcing the jaws and teeth of the lower

Fig. 19.

Fig. 20.

Fig. 21.

Fig. 22.

arch inward, and the teeth of the upper arch outward.

The inclined plane was made by joining two pieces of plate gold. A piece of soft wax was first molded on the lingual side of a cast of the lower incisors and canines, the surface of the wax being shaped to project upward and backward in the form required for the inclined plane. An impression was then taken of

Fig. 23.

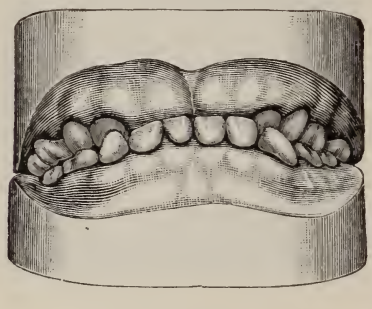
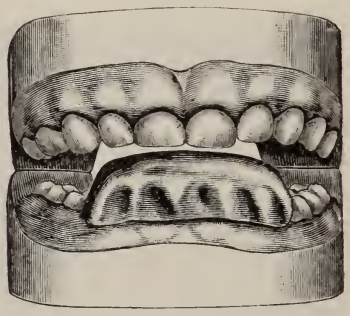


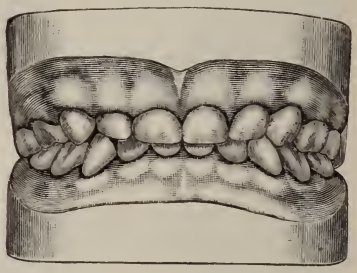
Fig. 24.



the labial faces of the incisors and canines, including the front and upper surface of the wax. From this impression a die and counter-die were made of fusible metal. A piece of gold plate was then swaged to fit the parts forming the front of the incline. The wax was then removed from the lingual side of the teeth, the plate of gold being held in proper position while another impression of the lingual side of the teeth and the projecting plate metal was taken with moldine. The gold was then withdrawn, and the moldine impression removed, after which a die and counter-die were made, and a plate metal was swaged to fit the lingual side of the teeth, projecting upward to join the piece of plate metal fitting the front of the teeth. The two pieces of plate were united with gold solder, and thus an inclined plane and cap were formed. The cap was then roughened on the inside, and cemented over the incisors and canines with zinc oxyphosphate.

The device was applied February 10th, and on May 7th it was removed. The natural force of occlusion had corrected the conditions, as shown in Fig. 25, there

Fig. 25.



having been no special discomfort experienced by the patient. The teeth were retained by the occlusion itself.

Apparatus for opening the bite should not be worn longer than necessary. The opening of the bite in any manner beyond the normal, if continued for a considerable length of time, is likely to prove detrimental to the occlusion. In opening the bite, the muscles are necessarily put on a stretch, and the teeth resting in contact, gradually become depressed in their sockets through the force of the occlusion, owing largely to the tonic contraction of the muscles.

Discussion.

Dr. J. W. Peete, Memphis, Tenn. The paper just read by Dr. Jackson is ex-

ceedingly interesting to us as students of orthodontia, and I have few, if any, criticisms to make. He has shown himself a genius, as all who have read his book well know, in devising a great variety of fixtures for correcting the various forms of malocclusion.

Under the first division of the subject, "opening the bite in the regulation of teeth," the essayist gives us a plan for making a good and efficient fixture. He says it is more commonly used for moving the incisors from lingual to labial position. In relation to these inlocked incisors it is in my opinion entirely unnecessary. Being a disciple of the Angle system I have always a positive and efficient means at hand that does not need a mechanical fixture to open the bite. There may be cases in which it would be an advantage to open the bite, but I agree with the essayist that they are very few.

Fig. 4 shows unilateral occlusion, entire lack of occlusion of the molars on the right side, lowers to lingual. In this case where there is entire lack of occlusion, and from this cause a condition of supra-occlusion has been induced, I think it would be well to open the bite, as otherwise a long time would be required to move these teeth.

Fig. 7 shows a plate for depressing lower incisors. Here again I must differ with Dr. Jackson. I do not wish to say that he cannot do the work that way, but I believe that there is a better way. I have not been able, thus far, to find a patient who was willing to bite persistently enough on an appliance to depress a tooth or teeth in the sockets. This is, I believe, the most difficult movement I have to make. Therefore I want a fixture that is entirely under my control, and not under that of the patient.

Fig. 14 shows an instrument for expanding the lower arch in the region of the second molars when these teeth are tipped lingually, which, it seems to me, is well adapted to perform the task.

I do not doubt at all that in Dr. Jackson's hands this system is the most satisfactory to him. As every man cannot be as skilful in the use of one kind of gold as he is with another, so it is with different systems of orthodontia.

Dr. W. E. Walker, New Orleans, La. I have had experience with the Jackson system and also with other appliances for depressing the lower incisors, allowing the molars to rest and extrude at the same time, and therefore I must take issue with the statement of the gentlemen who preceded me, that that cannot be done. Of course he is only expressing an opinion. I believe, however, that Dr. Jackson could say, and I will say, that there is no doubt about it at all.

But coming to the paper itself as to the Jackson system: As long ago as ten years I gave clinics with it, and have used the system quite a little, and am therefore glad to be able to speak in its behalf, using as I do the best I can derive from the various systems presented to the profession. With reference to opening the bite by soldering a piece of metal over the molars attached to the Jackson crib: In one case I soldered to the metal another piece in the shape of the letter W, on each side of the mouth, which struck just in front of the lower cusps, and carried the lower jaw back and the upper forward in a case of lower protrusion, and it worked very satisfactorily. I might mention for the benefit of those who work with this system, that they will find the electric soldering iron a great advantage, in that it retains the heat while one is working with it.

Dr. W. O. Talbot, Biloxi, Miss. I have not had sufficient experience with the Jackson system of appliances to speak with authority about any of the forms he has shown tonight, but have used some of them, and I must say with success in a number of cases. In the use of this system I have been impressed with the importance of perfect adaptation of the appliances to the teeth. I also appreciate the points which were brought out by Dr. Jackson in regard to the length of the arms of the appliances. I wish to compliment him on the great amount of skill manifested in the detail of construction of the various appliances that he has devised to produce these movements. In cases where the patients cannot be seen as often as would be necessary were any of the other systems used, these appliances come in very nicely, and I have been using some of them to advantage in such cases. Of the value of the appliances for producing the exact movement that has been shown on the screen I am not prepared to speak, because I really think that in any system of appliances the man who has had experience with them is better prepared to speak than those who merely theorize on them. I think that where we have patients under our control, and can see them often, many of them can be treated in a shorter time with other systems than the Jackson. I use more of the arch appliances with the clamp bands cemented to the teeth, known as the Angle system, being a student of that system of correcting dental irregularities. I cannot tell in the unfinished cases as shown here whether or not the desired relations for all the teeth were secured. There was one case shown in which Dr. Jackson used the appliance for harmonizing the relation of the arches, and I wish he had shown us the profile view of the cases after completion of the treatment. I hope he has the casts with him, and that we may see them tomorrow. We cannot tell from a front view of the casts whether the mesial relation was established as would be desired.

I do not remember whether Dr. Jackson showed a cast of the finished case of unilateral lingual occlusion.

Dr. Jackson. I did not.

Dr. Talbot. I have had some experience in the treatment of these cases, and I have met with good success by using the arch bar, and pitting one whole side of the arch against one tooth on the opposite side, beginning with the most distal malposed tooth, but I have never tried the appliance shown in that class of cases, and therefore cannot speak with any authority on the results obtained in this case.

I wish to thank the essayist for the paper, and to say that I enjoyed it very much.

Dr. W. D. Monroe, Washington, D. C. I do not know of any study that comes before us that is as neglected as this. I have followed Dr. Jackson's work for a good many years, and never miss an opportunity to see his casts and to hear his papers; and as for myself, I think it is the only system that I have ever been able to get anything out of—really the only system that we can call a system.

It is one of the most discouraging things in the world to start to make a Jackson appliance after being accustomed to using hard solder. However, after becoming familiar with the procedure, and following the few points that Dr. Jackson gives us, the appliance can be readily made, and will go to place as nicely as any appliance you have ever used, and it will stay in position. I think

if any man will follow Dr. Jackson's ideas, and apply a little common sense to this work, he will have success, and Dr. Jackson is always ready and willing to give any points regarding the system. As for myself, I cannot say too much for it, and I am only sorry that so few are here tonight to discuss the paper.

Dr. J. A. Gorman, Asheville, N. C. I enjoyed the demonstration of the making of the appliances, but greatly regret that Dr. Jackson did not exhibit more of the cases completed—showing the final occlusion.

Dr. Jackson. Occlusion is not the subject under discussion this evening.

Dr. Gorman. Speaking of driving the teeth down: I really think that instead of driving them down in their sockets and holding them there, we have a tendency to bring the other teeth up, making a happy medium.

Dr. Peete. Dr. Walker spoke of my saying that it was impossible to produce the results Dr. Jackson has shown with his methods. I do not think I said that, but what I meant was that I believed Dr. Walker, being familiar with the system, can do things with it that others not equally familiar could not possibly accomplish.

Another thing I wish to say: In reference to the spreading of the lower arch in the neighborhood of the molars, I can think of no plan which is more effective than that which consists in the application of the spring wire to the second molar tips when these teeth are only partially erupted. According to my system, it is difficult to place my anchor bands on those molars when they are partially erupted, but with the spring wire I can see that it is perfectly possible. I think there are a great many things in his system that I like, and a great many that I do not, although I may think differently after seeing Dr. Jackson's clinical demonstration.

I do not think, however, that it is easy to depress these teeth by the natural occlusion. We find when the teeth become tender that the patient will not apply the necessary force, therefore I like to have a force that is under my control.

Dr. Jackson. Tell us how you do it.

Dr. Peete. By the application of anchor bands and expansion arch. In the cases where the lower incisors impinge on the gum, there is seemingly a shortness of the molars and bicuspids. Here the question arises, Shall we depress the incisors or raise the molars and bicuspids? By a careful study of the casts, face, and lips, you will frequently find that one has to have recourse to both procedures.

Having decided thus, I apply the anchor bands to the molars, place the expansion arch in position, and attach to it the anchor bands with wire ligatures or spurred bands and ligatures. In this way I lift the molars, and at the same time depress the incisors with hooks made of thin metal, engaging the incisal edges, or with ligatures, according as to whether I want to move them labially or depress them only. A force is thus produced that is positive and under control of the operator. In the movement of the inlocked incisors by means of the expansion arch with ligatures and screw, in all such cases it is absolute, and only a short time is required to do it, with a minimum of pain and little or no inconvenience to the patient.

Dr. J. Rollo Knapp, New Orleans, La. I think we all regret that there are no more present to discuss the paper to which we have listened with so much pleasure this evening. Dr. Jackson is a

man, doubtless, of a great deal of skill and ability, particularly in regard to orthodontia, but there are, to my way of thinking, some other very good methods. I was in Chicago a short time ago, and attended a meeting of the largest local dental society in the world. I saw there a great many beautiful casts and some practical cases shown by Dr. Case. I also had the pleasure of visiting Dr. Angle's office in St. Louis, and there I saw about two thousand casts of some very difficult cases that he had carried forward to a successful termination. There is also a Dr. Knapp—not myself—whose appliances I see advertised in the journals, and he too must accomplish wonders in these directions. It is a pity that there are not some of these men here to discuss this paper, and to answer some of the questions asked by Dr. Jackson. They must do it in some way, I imagine.

Dr. Jackson (closing the discussion). I am pleased with the discussion of the paper, but I should judge from the remarks of some of the speakers that they have but a very slight knowledge of my system, and of what can be accomplished with it. I am here this evening to show how to open the bite, and how to depress teeth in their alveoli. One of the speakers says that he does not think I can depress teeth in the manner I have described. He has not told us very clearly how he depresses them. The method he gives of adjusting an expansion arch and tying the teeth to it depresses the teeth in some cases and does not in others. The tying of teeth to an expansion bar has proved a most uncertain method.

He speaks of the teeth being made sore by the use of my appliances. The teeth do not get uncomfortably tender if the appliance is managed at all intelligently, and the patient can masticate easily at any stage of the regulation. That is why I claim that this is the "humane system," and up-to-date orthodontia.

I would like to ask Dr. Peete how often he sees his patients each week.

Dr. Peete. Once or twice.

Dr. Jackson. I see my patients usually once a week, sometimes once in two or three weeks, the apparatus being removed by the patient for cleansing. Dr. Peete says that my appliances are slower in action than those he uses. Any amount of force desired can be applied. I think after Dr. Peete sees the casts that I am going to exhibit, he will be able to speak more fairly on the subject.

I am showing you a painless method of accomplishing difficult work—work that we have not known how to accomplish painlessly before.

As I have stated, I have been able to reduce the movement of the teeth to practically an exact science. It is impossible to accomplish this with an expansion bar, as when it is adjusted and additional force is applied to a bicuspid or canine tooth on one side of the arch, the force imparted tends to drag outward some of the teeth of the opposite side of the arch, which in many instances is objectionable. With my system, we have the advantage of using definite anchorage on one side of the arch, and the teeth are not loosened in their sockets in forcing outward one or all of the teeth of the opposite side of the arch.

One of the great advantages I claim for this method is that the regulating is done in definite steps, as the changes can be appreciated each time the case is examined. This is accomplished, as I have described, by making a tracing of the appliance before force is applied, and a dot mark by the side of the tracing of the distance it is desired to change

them so as to give the required degree of force. The appliance is then bent to conform to the new marking, and the tracing kept as a record.

Regarding the time employed in the regulation of teeth in special cases, at the demonstration tomorrow I shall present casts showing conditions before and after correction with the apparatus in place. This you seldom see with other methods. I will show how both arches are expanded at the same time with no discomfort to the patient, and I challenge anyone to show as marked expansion of the arch, accomplished with as few visits of the patient.

Dr. Talbot. Dr. Jackson has asked if those who pay particular attention to occlusion ever show their cases with the apparatus in place. I would like to ask him if he has read the proceedings of the American Society of Orthodontists; if so, he will see there a great many cases shown with the apparatus in place.

Dr. Jackson. If Dr. Talbot will look over those proceedings and those articles, he will see that they are principally by Angle students, and the same line of thought runs throughout all the articles. I will repeat that you seldom see the apparatus in place on the cast. We see pictures in advertisements, etc., but do you see the appliance on the cast with the ligatures in place?

Dr. Talbot. Plenty of them.

Dr. Jackson. I have shown apparatus which the patient can remove in order to cleanse them, and to cleanse the teeth, there being no excuse for congestion of the gums; and the operator does not have a filthy mouth to contend with —frequently so filthy that he has to wash his hands a second time to deodorize them, and this in the day of prophylaxis. I am showing a system by which one can see and attend to more patients with fewer visits than by any other method of which I know. Remember, gentlemen, that I have been in the field for a considerable number of years, and have tied and twisted ligatures. Only last year, I saw students in colleges twisting ligatures in the mouths of patients for the correction of irregularities, and the tears running down the patients' cheeks. We have nothing of that kind to contend with in my system.

In regard to the application of the method, these appliances have been made by an expert in about thirty-five minutes. How much time is spent in making apparatus and applying it to position with other systems, requiring valuable time that might be given to other patients! I am here to show how to do these things, having no other interest than to help the profession and the patients.

I want to thank you for your kind attention.

The next order of business was the reading of a paper by Dr. A. P. Burkhart, Buffalo, N. Y., entitled "Rubber-Dam Method of Abutment Preparation, Interchangeable Facings, and Cementation," as follows:

Rubber-Dam Method of Abutment Preparation, Interchangeable Facings, and Cementation.

By A. P. BURKHART.

"MODERN crown and bridge work belongs to the department of dentistry formerly termed *mechanical,* but the judgment, skill, and scientific information required place it far above ordinary mechanical dentistry, which has sunk to a low estate since the introduction of vulcanite."

It can also be said that no branch of dentistry is more abused by avaricious and unscrupulous men, because wilfully they employ it when other means are indicated. Abuse is also shown, as observed by the conscientious dentist, in faulty work and slovenly prepared abutments, and in hideous and disfiguring gold crowns in the anterior portions of the mouths of thousands of patients.

You will observe that bridge work has its dark side, but it also has its bright side, and is a blessing and a comfort to patients when it is honestly recommended and artistically constructed. The interests of the patient should be the guiding principle in all our operations, and a careful examination should plainly and definitely indicate the best system suitable to his case. To arrive at a conclusion, the mechanical portion of the operation is not the only element to be considered; pathology and therapeutics must not be overlooked, if we intend to treat our patients as we would like to be treated, were we to undergo a similar operation.

I shall not attempt to enter into a discussion of the mechanical phase of the subject under consideration, so far as mechanical methods are concerned in the construction of crowns, but shall direct your attention to the preparation of abutments, detachable and interchangeable facings, and cementation.

Close observation for a number of years has convinced me that the preparation of abutments does not receive the average conscientious attention it should, and justifies this conclusion: A dentist who will insert a single crown, or a bridge, upon an inaccurately prepared abutment or abutments, and depend largely upon the cement to keep the crown and bridge in position, is not honest with himself, and certainly has not treated his patient in a manner he would be willing to be treated himself, were he to undergo a similar operation.

Brooklyn bridge, one of the marvels of engineering skill and mechanics of the nineteenth century, and similar structures which have safely carried millions of humanity from shore to shore, would long since have proved disastrous to life had the same proportionate indifference been shown in the preparation of abutments and piers as is displayed too frequently by many members of the dental profession when approaching and preparing the abutments for a bridge in the mouth of a patient. The bridge in the mouth, as compared with Brooklyn bridge, is infinitesimal, but the underlying and governing principles of construction of the two are alike. Foundation exposure is essential, and truly is this so in the mouth of a patient. And

how is this best attained? I answer, By the use of rubber dam held in place by wide-flanged clamps, and sometimes by ligatures; most frequently, however, by clamps. The rubber dam I have thus employed for a number of years, and with pleasing results.

The careful orthodontist obtains accurate casts of the mouth of his patient, so that he may be enabled to study the case under consideration. This rule I also follow in cases requiring medium or large-sized bridges. With the casts articulated I am enabled to devise a safe line of construction from start to finish, and having formulated my plan, I proceed with the preparation of the abutments. After adjusting the rubber dam over a sufficient number of teeth, and extending it over open spaces as quickly and painlessly as possible, I reduce the tooth-substance and accurately prepare the abutment or abutments, unhampered by saliva or secretions of any kind. There are exceptions to all rules, therefore I do not want it to be understood that in every instance I adjust the rubber dam, although I do so in the majority of cases.

In the preparation of the abutments humane treatment should be exercised; therefore, previous to the adjustment of the rubber dam, the gum surrounding the necks of the teeth should be treated with cocain, which will enable the operator to depress the rubber dam painlessly by means of clamps and ligatures, and thus produce an exposure of the necks of the teeth to a surprising degree. Nowhere in the mouth will the painstaking operator appreciate exposure of tooth-structure more than in cases of forward tipping of molars or bicuspids, especially molars. The use of the rubber dam will be found particularly useful in adjusting the Logan, Davis, Twentieth Century, or any other make of porcelain crowns on the anterior teeth. With the rubber dam in position, I proceed with the reduction of tooth-substance, using the knife-edge carborundum disks made by Lee Smith & Co.

With the sharp-edge disks one can slice down the bulging portions on the anterior and posterior, and labial and lingual surfaces of molars and bicuspids, and this when accomplished will render the tooth almost square shaped. Next, carry the now blunted disks backward and forward over the occlusal surface, thus avoiding long-continued pressure and undue friction at one spot. This variety of disks does away with the violent jarring and friction which the coarse stump wheel produces on the nerves of the patient. Having reduced the sides and occlusal surface, I next complete the final shaping and polishing of the abutment with sand-paper disks. My work is simplified, and the tooth being operated on is kept cool by means of a stream of compressed air directed upon the tooth by an assistant.

In the preparation of abutments, if the teeth are extremely painful, by means of pressure anesthesia I am enabled to shape a tooth to my liking, without causing the patient an undue degree of pain.

Some of my fellow practitioners may consider the use of the rubber dam a waste of time, but they are certainly mistaken, as it means instead a great saving of time. Some may consider it impracticable, but to each I can say, experience is the best teacher. I have had the experience and know whereof I speak, and am sure that if my esteemed fellow

practitioners will give the method I have outlined a reasonable trial, they will obtain surprising results.

DETACHABLE AND INTERCHANGEABLE FACINGS.

With the introduction of crown and bridge work, a surprising demand for porcelain teeth or facings arose; but after the lapse of years, the leading tooth-manufacturers have failed to produce anything besides the pin tooth. It is true that better shaped teeth and a greater variety of molds are in existence today than at the time of the introduction of crown and bridge work, but so far as durability and strength are concerned the porcelain is no better at the present time than it was formerly when used for artificial work on gold and silver.

Experience has shown clearly that while the ordinary pin teeth will do for gold and silver plate, they are found deficient in crown and bridge work. After exercising the greatest care with pin facings, the careful operator is always uncertain as to the final outcome. Discolored facings—the result of high heat in soldering—and broken and checked facings confront him, and the conscientious operator becomes sick at heart. It is likely that many within the sound of my voice, after having exercised all the skill and care possible in the construction of a bridge, have been confronted with results such as just pictured, and thus ideal work has not been obtained.

Pin facings have been our great annoyance in the construction of bridges and even single crowns. In the main they are defective when proportion is considered. They are too narrow at the neck, as compared with the breadth of the incisal edge, and as a result, unsightly V-shaped spaces are to be seen between the teeth when a case is completed. These large spaces are particularly unsightly when considerable absorption of gum tissue has taken place, but happily I have been able to avoid this glaring defect by the use of a comparatively new product—a detachable facing.

Pin facings, as stated, are objectionable when the danger of checking and lack of proper proportion are considered. To these faults must also be added that of change of color due to the high heat essential in soldering. Naturally the question arises, Is there any product which overcomes the defects mentioned? If there is, the facing must be detachable and interchangeable, thus permitting the production of a crown or bridge without subjecting the porcelain to heat at all during the process of soldering; it must be of proper proportions, nearly as wide at the neck as at the incisal edge, and thus with the approximal surfaces nearly parallel the unsightly V-shaped spaces will be avoided.

Ever anxious to take advantage of every mechanical improvement in dentistry, I hailed with delight the Mason facings when they were placed on the market. The product was never fully appreciated by the dental profession. Since the introduction of them, further advances have been made, and notably Steele's interchangeable facings. A little over two years ago I began using the latter, and with satisfactory results. I never worry over checked or discolored facings now. Think for a moment what it means to use a facing of this character! It means a bridge with facings free from checks and discoloration and devoid of large V-shaped spaces, display of gold between facings, and unsightly gold tips. The Steele facings are valuable when a bridge is inserted shortly after extrac-

tion, and later, when absorption has taken place, the facings can be replaced with longer ones without the necessity of removing the bridge. Time is saved in the construction of crowns and bridges, and if repairs are needed they can be made easily and quickly. In order to get the best possible results with the Steele facings, the instructions laid down by the manufacturers—chiefly so far as cleanliness of the backings and facings is concerned—must be followed. With each facing comes a metallic backing either of gold or platinum, as the operator may elect. The facings slide on and off easily, and this condition must continue during the whole process of construction.

My early experience was somewhat annoying when constructing an arched bridge. I found that, after soldering, the facings would bind on the backings, but I overcame this by the following method: After grinding the facing and fitting the backing to it, I remove the latter and invest it, and then I fully back the metallic backing with 20-k. solder. This process I apply to each dummy and then assemble all on the model, leaving for the final soldering only the joints between the backings; requiring little solder, the backings do not warp, and allow the facings to slide on easily. I am convinced that the best results are obtained either with pin or with interchangeable facings, when each crown or dummy is constructed separately, and then all assembled and soldered.

Instead of crystal cement, I now use Evans' gutta-percha cement for attaching the facings to the backings. I prefer gutta-percha because the facing can be removed without injury if subsequent removal should be found necessary.

I have had dentists say, "I prefer pin facings because they are cheaper than the interchangeable ones." The dentist who reasons thus makes a mistake, and the quicker he divests himself of the idea of cheapness of materials when constructing crowns and bridges, the better for him. The ethical dentist should always use the best materials, in order to place himself on a high plane and have the conscious satisfaction of having given his patient the best obtainable, which in turn will justify him in demanding a fee commensurate with his efforts and skill.

CEMENTATION.

While pin facings have been a source of annoyance, misfortunes from another source have come to me: I refer to cementation. The cementation of crowns and bridges has been with me a subject of close study. Many times, for various causes, have I wished for a method to remove easily a crown or a bridge; my desire was not gratified, however, so long as I continued the use of crystal cements. Patients have come to me and said, "Doctor, that bridge you set for me bothers me, as one or more abutments are sensitive to heat and cold;" or the patient would report a cap loose on an abutment, while the others were perfectly firm. To remove a bridge, as suggested by safety and duty, involved, under such conditions, tremendous labor, mutilation of crowns, and pain to the patient. The conditions mentioned confront nearly every dentist, whether he be of limited or of extensive experience.

Many valuable abutments are destroyed because of the difficulty attending the timely removal of bridges set with crystal cements. For years I have used gutta-percha almost exclusively, and with great satisfaction, in setting single crowns, and about three years ago

I began using Evans' gutta-percha cement for setting bridges. At first I used it cautiously, but now I use it almost exclusively. I can quickly and easily remove a crown or bridge now, should occasion require it, and avoid mutilation of the crowns and abutments. I now make it a rule to instruct my patients to return for examination at stated intervals, and if dangerous symptoms present themselves, I remove bridges or crowns and perform such services as will best benefit my patients. Had I used gutta-percha cement earlier in my practice, and observed the rules I do now, I should doubtless have prolonged the life and usefulness of many abutments.

I believe it is good practice, from a sanitary standpoint, to remove bridges from the mouths of our patients at stated periods, and thoroughly cleanse and deodorize them. Fixed bridges, however well and carefully constructed, become foul after a time, and sometimes contaminate the breath.

I am sure the suggestions that I have made regarding my method of abutment preparation, the use of Steele's interchangeable facings, and gutta-percha cement, will be of value if given a fair trial.

Discussion.

Dr. J. D. Patterson, Kansas City, Mo. I was very much pleased to hear the paper. I am interested in the Steele facing, and am using it with a great deal of satisfaction. However perfect our operations may be in using pin facings and in soldering them, there is always, with the most successful as well as with those who are not so successful, a great deal of dissatisfaction because of checking the facing and the difficulty of making a perfect repair without mutilating a bridge or crown. Sometimes the replacing of a facing proves very satisfactory, but often it is not so; and I hail the Steele facing as the best that I have ever tried, and I think I have tried all of the removable facings. The simple objection which I have and of which I have often spoken, is that the backings should be made of platinized gold or platino-iridium.

Dr. Burkhart spoke of the backings being made either of platinum or gold. They are made of something similar to platinoid. I have entirely discarded those made of so-called platinum and use the gold ones altogether, but I think these backings should be made of iridio-platinum. Sometimes, in forcing these facings on, the barrel is ruined, or melted down in soldering, but if they were made of platino-iridium they would be much stronger. Aside from this one objection, it is the most satisfactory way of placing facings of which I know.

Dr. N. C. Leonard, Nashville, Tenn. I am impressed with the need of a better porcelain facing and one that is amenable to our needs. While I am not familiar with the Steele facing, I am prepared to believe that there is quite an advantage in its use.

As to the cementation of the bridge with gutta-percha. I appreciate the immense advantage of this method, because of the fact that it is often necessary to remove a piece of work after it has been cemented on, a task difficult to accomplish without mutilating the bridge or crown. I think the essayist is quite right in saying that it is frequently important to remove a piece of work to cleanse it. I have been accustomed to the use of gutta-percha in cementation, but am not familiar with the character of cement that he refers to. I have been in the habit

of filling the contour portion of the crowns with gutta-percha, and then cementing with the ordinary cement, so that when removal is indicated, by warming the bridge slowly the gutta-percha will be softened, when the bridge can be slipped off of the abutments.

Dr. A. J. Cottrell, Knoxville, Tenn. We are of course very much interested in the remarks of Dr. Burkhart on the use of the interchangeable facings and gutta-percha cement. I think that a cement which permits of the removal of a bridge would be acceptable to any dentist; this is not a debatable subject, it is an accepted fact. But there is one point that I wish to emphasize, namely, the essayist's idea of the application of the golden rule in the making of bridges. I believe that if each dentist, when a patient is in the chair, were to say to himself, "If this were my own mouth and my own bridge, how would I like to have the work done?"—that if we were to apply that reasoning to each and every case our patients would be better served, our reputations would be wider and broader, and our consciences would trouble us less. Gentlemen, do unto others as you would have them do unto you.

Dr. Burkhart (closing the discussion). Dr. J. D. Patterson spoke more particularly about the form of the backing. The Columbus Dental Manufacturing Company, who produce these facings, make three qualities of backings —platinoid, platinum, and gold. I know about the platinoid backing because I used it in my earlier practice, much to my sorrow. With the backings that I have used in recent years—namely, the platinum and gold—I have had no difficulty. Dr. Patterson also said that the manufacturers were open to suggestions. This is true. I made some suggestions recently which the company that manufactures these teeth has under consideration. I am sure that there is not a single dentist who, after once using these facings intelligently, will discard them. While I believe the Steele facings have many advantages over other products, I think that American genius and ingenuity will eventually produce something which will be still better, but at the present time they are the best we have.

Dr. Cottrell said that we should follow the golden rule in all our work. How frequently are crowns and bridges put in without at all considering the interests of the patient! In the early portion of the paper—and this is a point which was not discussed at all—I spoke of the use of the rubber dam in the preparation of abutments. This is an idea that I have never heard discussed at any meeting, and I have presented it on two occasions. But I can say to you that if you will use the same care that I do, you will not have cause to regret having adopted this method. By this means the tooth around the margin of the neck will be exposed to a degree that will astonish you, and will enable you to accurately shape the abutments.

There is but one other suggestion that I desire to make. I intended to have spoken of it in the paper—the investment of single crowns and bridges. I make a point of saving every box in which sand-paper disks are put up. In these boxes I invest my cases preparatory to soldering, whether it be a single crown or a bridge. In the majority of the boxes a small bridge can be placed. The advantage of this method is that the box acts as a matrix, confines the investment, and does not allow the investment material to spread, as it does, for instance, on a piece of blotting paper, and conse-

quently forces the material close into the joints of the backings and facings. When I invest a bridge I secure a pasteboard box a trifle larger than the bridge, and when the investing material hardens I scrape off the pasteboard and trim the investment if necessary. Save all pasteboard disk boxes; they will be useful.

The next order of business was the reading of a paper by Dr. C. N. Thompson of Chicago, Ill., on "Reflected Shadows Accompanying Porcelain Fillings." Dr. Thompson was not present to read his paper, and it was therefore read by Dr. A. H. Peck of Chicago, as follows:

Reflected Shadows Accompanying Porcelain Fillings.

By C. N. THOMPSON.

In restoring the lost parts of teeth with porcelain inlays, an exact match in appearance is probably considered the most difficult part of the operation, the success of which depends upon the exactness with which we produce the natural conditions. But depending as we do upon materials that differ in physical properties to the extent that porcelain and cement do from the natural tooth, we are compelled to make use of certain artifices intended to offset the shadow that is the result of the unnatural reflection, refraction, absorption, and transmission of light by these materials.

Color, of course, is a factor of great importance, and in itself would constitute an ample topic for an entire paper; but when we remember that it is quite impossible to invisibly repair a broken porcelain tooth by means of cement—in fact, almost impossible to even replace the fragment in any way so that the fracture will be invisible—it would seem that color is not the only factor in the final appearance of finished porcelain fillings. The fragments being absolutely exact in color, translucence, form, and thickness, and the cement being of a good color, it is evident that aside from color there are other phases of the phenomena of light which affect the finished inlay detrimentally, unless forestalled. The only way in which the fragment of a broken tooth can be replaced—concealing the fracture—is to moisten both with some liquid of the same reflective index as the tooth, which in absolutely filling the space, cancels the reflective surfaces of the fracture, both internally and externally, thus permitting the light to proceed as it did before the break occurred.

THE CEMENT PROBLEM IN RELATION TO COLOR.

Water answers admirably, but unfortunately it, like all other translucent substances of which we know, is of no practical value as a cement, so we are obliged to return to zinc oxyphosphate and its gloom, because it is *adhesive*. It may not be out of place to mention that although Ascher's enamel cement has practically no adhesive properties, and consequently little value in retaining inlays, yet its power of transmitting and reflecting light is so nearly equal to that of the natural tooth-enamel that certain shades of it interfere very little with the free

passage of light, and it therefore comes very near being ideal in appearance. It is unfortunate that the good qualities of the cements mentioned cannot be incorporated into one—but a cement of the proper color, translucence, adhesiveness, and strength to fill all requirements, would mark the beginning of the end of the inlay question.

DIFFERENCE BETWEEN THE NATURAL TOOTH AND PORCELAIN IN REACTION TO LIGHT.

A study of the normal tooth reveals the fact that its exact reproduction is impossible, yet to restore tooth-structure in appearance with porcelain without due consideration for the details of the make-up of the normal tooth is a mistake, for an examination of a cross section of the natural tooth reveals the enamel nearly transparent and the dentin nearly opaque. Compare this with a cross section of a porcelain crown, and it is not hard to discover the reasons for some of our difficulties, as well as to know that there must be method in our efforts if we would secure results.

Dentin is so nearly opaque that it transmits light but feebly. Its opacity seems to be due, as much as to anything else, to the condition of its external surface, which is without glaze —under the magnifier it seems rough, like fine sand-paper. The external surface stops the light as do crushed transparent substances generally—as for instance common salt—for the reason that the rays of light are so often reflected among the particles on the surface that they are scattered into a multitude of crossed reflections that appear white, and therefore cannot enter. Thus it follows that whatever surface will not admit light will also refuse to allow a reflected shade to pass; consequently if the dentin can be restored with a very high-fusing porcelain that becomes densest before it glazes, that presents a vitreous surface resembling sand-paper, and of the color of dentin, we have produced a foundation for the filling that will not absorb sufficient light to cause a shadow, and which, if not glazed by a subsequent baking, will still retain the power to arrest transmitted light, no matter how the colors and enamel are laid on afterward.

The only phase of color I shall mention is that of red. A pulpless tooth usually assumes a grayish aspect, probably due to the oxidation of the contents of the tubuli of the dentin, whereas there is something in a vital tooth that gives it a lifelike appearance. We all know that the dentin immediately covering the pulp is pink, and if it be a fact from any cause that there is a red or pink tinge to the dentin close to and surrounding the pulp of a vital tooth, may it not be that the color of the normal dentin, if analyzed, would reveal red? Following this thought, it has been the custom of the writer to make use of red in deep cavities, laying a little of it on the matrix beneath the foundation body in the vicinity of the pulp, and the result produced warrants the supposition that red is present in vital teeth, and is necessary for the production of a lifelike filling.

Let us study the normal tooth filled with porcelain as it is seen in the mouth under normal conditions.

First, it is covered with moisture, which partly veils small mechanical defects, modifies the superficial, structural, and physical differences of the filling and tooth, fills the interspaces of the cement at the surface, and reflects a portion of the white light.

Next, through it we see the convex surfaces of the tooth and filling where another portion of the white light is reflected, and where reflections from near-by objects begin to appear. The tooth-enamel is as though polished, differing from the glaze of the porcelain. However, all teeth are not alike in this respect; even those in the same mouth may differ. But seldom do we see natural tooth-enamel having as high a finish as well-glazed porcelain, and consequently it improves most porcelain fillings to polish that portion next to the labial cavity margin after it is set because it makes the surfaces more nearly alike. Comparing porcelain enamel with the natural structure, we find that it is not difficult to produce a substitute that resembles it in a general way—until its reflective and refractive powers are considered. Its translucence is very much the same as that of natural enamel, but as it is only a fused translucent crystal covering the inner parts of the filling, it becomes an elliptical cavo-convex lens, with all the abortive phenomena which accompany such instruments. The natural enamel with its radiative arrangement of enamel rods, whose refractive and reflective indices vary in accordance with their various positions, produces an entirely different instrument, for at the median line of the teeth the enamel rods point nearly toward the eye—those on the same perpendicular plane—while those on the sides are at right angles to them; this must inevitably produce a reversal of the reflecting index of each rod and consequently of the portion of the tooth which they occupy. This in the writer's opinion explains why an approximal gold filling appears not to darken its approximating neighbor, if it be a sound one, to the extent that it would if filled with porcelain, because natural enamel does not accept impressions as does the porcelain enamel, on account of the repeated reflections among the rods; also explains why the appearance of most approximal fillings are improved by a very thin layer of opaque white at and on a line with the contact point, or a trifle more to the labial on the approximal exterior, which prevents the passage of any reflected shade.

OTHER OPTICAL PRINCIPLES INVOLVED.

As a consequence of the rectilinear motion of light, opaque bodies cast shadows, which fall as a result of some obstruction to the free passage of light, and their location, extent, and intensity are dependent upon the extent to which the light-rays are transmitted, reflected, refracted, or absorbed by the obstacle.

"A shadow is partial darkness caused by the intervention of something between the space contemplated and the source of light." Reflected shade is that phase of the phenomena of light that affects porcelain inlays following final insertion.

All illuminated bodies scatter or reflect light, and are distinguished from each other by the kind and amount of light they send to us, their power of selective absorption and surface reflection determining the color. If the source of light be a point, as in the electric arc light, the shadow is sharply defined; if, on the other hand, it comes from a luminous surface, as the sun, the edges of the shadow are fringed and imperfect, due to the angular magnitude of the sun. For example the shadows of minute objects disappear almost immediately in sunlight, whereas the same objects in the arc electric light cast a well-defined shadow for a considerable distance if thrown upon a

screen. This explains why porcelain fillings are more conspicuous in artificial light than in sunlight, the shadows thrown appearing more definite.

When light passes from one optical medium to another, a portion of it is always turned back, *i.e.* reflected. This partly explains why a highly glazed filling that does not appear correct may be improved by grinding or polishing. A slight roughening of its surface causes less direct exterior reflection, and although it thus renders the surface slightly more opaque, it renders the deeper coloring more prominent, because light is reflected regularly and more fully by a glazed surface.

One of the fundamental laws of optics is that the angle of incidence in light-rays is equal to the angle of reflection, which helps us to understand why the shadow that is thrown upon one object by another may be passed on and accepted as the real shade of the object thus thrown in the shadow, particularly when the shaded object is convex, as are the teeth—which greatly increases their range of power over the plane surface for accepting and reflecting impressions that occur at right angles to the perpendicular, as are the approximal surfaces of teeth, where shade is most apt to occur, and usually does, particularly if that surface be discolored, decayed, or filled. In any event, whatever shade exists in a given approximal space is reflected back and forth from one surface to the other until it reaches a point on the convexity of the tooth that will reflect it to the eye, which establishes the limits of the shade at that point.

For example, a gold and a porcelain filling in contact between the central incisors: The porcelain filling, even though an exact match in color, will appear darkened as soon as placed in a cavity fronting a gold filling, because instead of returning the reflected shade to the gold again, its convexity sends the shadow of the gold to the eye, which gives it a saddened appearance. But if the filling be not scientifically constructed it will absorb a portion of the shadow and return it to the eye by internal reflection, which will make it appear still more darkened. To offset the discrepancy between artificial and natural enamel in transmitting impressions, it becomes necessary, in protecting approximal porcelain fillings against side shadows to cover the approximal exterior of the filling fronting the shade with a thin layer of opaque white, which practically prevents shadows from entering the filling, thus allowing it to appear as intended, because it cannot reflect a shade that it does not receive.

Reflection always accompanies refraction, which phenomenon causes much of the uncertainty of results in laying on colors, because the enamel being translucent, light passes through it to the pigments, where color is established, and being returned to the eye by internal reflection, in emerging through the enamel it is refracted and reflected at both surfaces of the enamel, and scattered by its convexity. This, in a meager way, in connection with the fact that we cannot see our colors until after the filling is fused and finished, is the reason why the color problem is so mystifying.

A solid body immersed in a liquid having the same reflective index as the solid, vanishes, and light in passing through media of different refractive indices is always reflected, and this reflection may be so often repeated as to render two transparent substances practically impervious to light. An opaque white is produced in this way. The blackest

clouds owe their gloom to this repeated reflection, which diminishes the transmitted light when seen from beneath; hence, also, their whiteness by reflected light. Common salt is white from the same cause, and transparent bodies generally, when crushed to a powder—because, though the particles transmit light freely, the reflections at their surface are so numerous that the light is scattered as is sound in echoes. A piece of glass is nearly transparent; crush it, and it becomes an opaque white; wet it, and it becomes semi-translucent. If it and the water were of the same reflective indices, the glass would disappear and the water would appear clear again. This partly explains why a filling of porcelain becomes a trifle more translucent, though a trifle darker after it is set, and becomes filled with moisture from the saliva; it also reveals one phase of the shadow that falls from the cement, in that the darkness of the cement is emphasized by the gloom produced by its repeated reflections in the body of the filling which retains it. It also suggests that the nearer a porcelain enamel can be based upon this plan—that is, two crushed crystalline substances of unequal refractive indices and of unequal fusing-points, the one to be suspended as it were, in the other, as is the crushed glass in water—the closer we will be to the production of an enamel that will come as close to nature as we could ever get, because while it would appear quite translucent, yet it would not transmit light as freely as some of our present enamels, and therefore would be more natural.

INTERNAL SHADOWS.

The only rational plan for controlling internal shadows, which in the main are caused by cement, is to have the latter covered by the natural tooth, so outlining the cavity if possible that the eye will find tooth-substance interposed between it and the submerged cement—between the tooth and filling. Strictly labial cavities are of course not included in this statement, yet they are partially protected in another way, for most labial cavities occur upon the gingival third of the tooth-crown, and the enamel necessary to reproduce nature is very thin at that point. This permits a correspondingly greater amount of foundation body, that if properly made will not transmit much reflection from the cement below it, and the amount that it does show will depend upon how thick the enamel is, for enamel will transmit such reflection readily, allowing the cement to show through at the margins. Fillings made in this way are affected less by lip shadows than if the enamel be thick or the filling semi-translucent.

In approximal cavities it is usually possible to cut beneath the labial plate, at least slightly, so that the submerged cement is hidden, as it were, below it, to the extent that light, in order to reach it through the filling, must strike the surface of the filling at such an angle that it would be reflected away, so that the tooth would be lighted by direct rays and appear as intended.

Definite shadows from cement imply that light, after being permitted to pass though the porcelain, must fall upon it, some of the light being absorbed, the diluted remainder being reflected back into the filling and returned to the eye direct, producing a saddening effect. Besides, reflection from the cement is increasingly darkened in proportion to the amount of porcelain the white light traverses in getting to it, and this applies likewise to the shadow.

When a filling is correct before cementation, and looks dead or leaden afterward, it is probable that its changed appearance is the result of light passing through several layers of semi-translucent color-pigment, each one selecting its portion of the white light, thus filling the light that reaches the cement with gloom, which when reflected back through the filling throws the whole into discord, producing a drab or gray—a color obtained by mixing the primary pigment colors. Such results are possible only when the filling transmits light too freely; because had the light been reflected back by the foundation body after penetrating the colors, as it should if correctly made, there would have been no light to reach the cement, consequently none to be reflected. Therefore the only detrimental effect that could be produced by the cement would be in rendering the filling more opaque and a trifle darker.

Fillings that appear correct from one direction and not from another are not sufficiently protected. This difference in appearance is due to reflected shade, which the faulty construction of the filling permits.

There is probably no way to entirely prevent shadows from being reflected into porcelain fillings, yet it is possible to confine both their extent and intensity to narrow limits, as follows:

First: By cavity formation, in order to conceal the submerged cement.

Second: By using a thin layer of opaque white on the approximal exterior of the filling that will prevent the entrance of reflected side shade.

Third: By making use of a foundation body of the same color and opacity as dentin, having an exterior surface which, being scintillant or faceted like the diamond, will act as a barrier to the passage of the light in the same way as does salt or crushed glass, which seems the only way of reproducing natural conditions as regards this phenomena of light.

Discussion.

Dr. L. E. Custer, Dayton, Ohio. I think the paper contains many new points on the construction and building up of inlays. It is true that if we at this date possessed a translucent cement, it would overcome the shadow problem to a large extent, but those which have been produced so far are not adhesive, and consequently we have to rely on mechanical anchorage. I believe Dr. Reeves, who introduced the building up of inlays in different colors, has been able to a large extent to overcome the shadow problem, but the essayist in this paper has gone a step or two farther, and has, I think, given us something considerably in advance of the method of Dr. Reeves. He tells us that one of the layers of porcelain should be of a red or pinkish color. How far that will prove to be a good step I do not know, but I believe it is well for all of us to at least give it a fair trial. It seems entirely reasonable as laid down in the paper.

I was especially impressed with the suggestion that we cover the approximal surface of an inlay, where it approximates a metal filling, with white porcelain. I believe there is a good deal of truth in what he says regarding that point.

There is no problem so disappointing to the dentist who is working with inlays as the shadow problem. We feel at this date that we have been very successful in securing these fillings in position, and I think that we should feel thankful to

anyone who will aid us in the solution of the shadow problem. For that reason I think we should accept a paper of this kind with great thanks.

The next order of business was the reading of a paper by Dr. L. G. Noel, Nashville, Tenn., on "Setting Crowns and Bridges with Gutta-percha," as follows:

Setting Crowns and Bridges with Gutta-percha.

By L. G. NOEL.

In crowning teeth whose roots have been in a condition of septic inflammation, a method of setting crowns that will admit of easy removal for further treatment has been earnestly desired, but not yet fully realized.

Other conditions may arise aside from dento-alveolar abscess or pericemental inflammation rendering it desirable to remove the work, such as a fractured facing or a desire to make changes in occlusion. Removal is well-nigh impossible when the work has been attached with zinc oxyphosphate cement.

Gutta-percha possesses qualities that recommend it especially for either permanent or temporary settings, being readily softened by the application of heat; but the obstacle in the way of its general adoption has been the difficulty of dissolving it so as to obtain it in a cement-like consistence.

Nothing can be more disappointing than a failure to carry to place a crown or bridge which has been carefully adjusted, for this will certainly derange the occlusion. The difficulty has been stated with almost all the preparations of gutta-percha with which your essayist has experimented, except the old solution in chloroform, which is too unsatisfactory to merit a second trial. It shrinks notably when the solvent evaporates, leaving a mere string in the canal, which furnishes no support to the work.

Encountering these difficulties, I set to work, hoping to obtain a solution that would have sufficient body to control the shrinkage and at the same time possess an easy flow under pressure, like that of soft cement. I think I have succeeded in obtaining a fairly good solution, and with it have had results that have been highly gratifying to me. I offer it to you for what it is worth, fully realizing that is by no means perfect, and that my own experiments are too recent to go on record as final. I hope you will take it up and give it a trial. Perhaps some of you will improve upon my ideas, in order that we may thus arrive at something truly good.

At present, I am proceeding as follows. Make the following solution of gutta-percha:

Chloroform,		
Oil of eucalyptus,	āā ℥j;	
Aristol,	gr. xx;	
Gutta-percha, q. s.		M.

This solution should be made in a wide-mouthed bottle and the stopper smeared with a little vaselin to prevent the evaporation of the menstruum, and also to make it easy of removal. It will take about a week to obtain a satisfactory solution of the gutta-percha, and it should be stirred from time to time until all lumps have disappeared, adding more gutta-percha, if necessary, until a creamy

consistence is obtained. I prefer the red base-plate gutta-percha cut in small pieces.

As the mercury sulfid which this variety of gutta-percha contains renders this preparation to a certain extent antiseptic, apart from the aristol, which is markedly antiseptic, no trouble will arise if a little should be forced through the apical foramen.

Now, when ready to set a crown or bridge, pour a sufficient quantity of this solution upon a slab, and with a strong spatula work into it a quantity of white zinc oxid, spatulating it thoroughly, and adding a little of the powder at a time, until the consistence of cold butter is obtained. The root-canals may now be filled by carrying in small quantities of it at a time with smooth broaches; the caps and crowns should also be filled, and the work carried to place.

This preparation has a smooth, oily, butter-like flow, and the excess will escape easily from the caps and crowns. The powder accompanying the zinc oxyphosphate cement will do as well as the pure zinc oxid. The gutta-percha undergoes a hardening process as time passes. This has been said to be a process of vulcanization, as it seems to be something more than a mere evaporation of its solvent. If it become desirable to remove the work, a little heating of the gold by applying the bulb of an Evans' root-canal dryer, which has been previously heated in a Bunsen flame, will soften the gutta-percha, and the work can be readily pulled off.

Discussion.

Dr. A. P. Burkhart, Buffalo, N. Y. As you will probably have noticed in my paper this morning, I am now and have been for many years very much interested in gutta-percha. The essayist said we knew gutta-percha to be an excellent temporary filling material in the treatment of teeth, and for the retention of a crown placed on a root the condition of which remains uncertain. Now, if it is a good material with which to test a crown for six months, it should be equally as good for permanent use. I have for many years used gutta-percha almost exclusively in setting single crowns. I began by using the plain gutta-percha. I discarded that, however, and began using the Evans gutta-percha cement. I also used S. S. White temporary stopping, and I found, as Dr. Noel stated, that this seemed to harden in the cavity to the density of vulcanite. As far as the preservation of the root is concerned, gutta-percha certainly preserves it better than do ordinary cements.

There are those who use the ordinary gutta-percha for setting crowns, and I think with good results. One method is by coating the pin with a solution of gutta-percha, allowing this to thoroughly evaporate, then filling the root with crystal cement and forcing the pin through the cement. This is a very good method, but in my experience the Evans gutta-percha cement will give still better results. I use gutta-percha for setting bridges in ninety per cent. of all cases, and thereby accomplish results which are highly satisfactory. I can best illustrate by citing a case in practice. I had occasion to remove a bridge—one I had set about a year ago—which rested on four abutments, two molars and two bicuspids. By drying the abutments or caps and then heating them, in a little over eight minutes I removed the bridge without mutilating a single abutment. It is an ideal material for permanent use,

one that enables us to remove a bridge easily if occasion requires, and by its use we are benefiting ourselves and our patients as well.

In discussing the cementation of bridges with gutta-percha, I have heard dentists say "There is danger of burning the mouth." If you use a little care, there is no difficulty. The great trouble is in being too hasty in trying to set the bridge—there is where the danger of burning the mouth comes in. With the Evans gutta-percha outfit there are two kinds of gutta-percha furnished—pink and white. The pink I use for bridges and the white for single crowns. Now, by carefully heating the bridge on the iron to the proper temperature, the former can be easily placed in the mouth without any danger of burning the tissues.

When you first force a bridge to place with gutta-percha, you will find a little curling up of the excess of gutta-percha around the abutments. Allow the patient to go away, and on his return in a few days, remove the excess. I would not advise cutting this away at the original sitting, but allow the gutta-percha to harden perfectly, for then it may be removed without endangering the portion protruding from the abutments.

Dr. Noel (closing the discussion). In my efforts to be brief I fear I have sacrificed clearness, and I want to elucidate a few points slightly. I have experimented with the various forms of gutta-percha in solutions, but with most of them, like the Evans, I have had trouble in getting the crown or bridge to place. If after laboring assiduously to make a beautiful piece of bridge work we fail to set it properly, we commit thereby a mistake which is very troublesome to correct. It was my desire to get a preparation that would not shrink so much as to allow of the crown coming out too easily, that led me to use zinc oxid. In the setting of a crown or bridge where it may have to be removed one or more times, or in the repairing of a broken facing, the gutta-percha spoken of by Dr. Burkhart is the ideal material. My idea was not so much to get a permanent material as to devise one that would hold the crown, and not undergo too much shrinkage. To prevent the rapid evaporation of the chloroform I decided to use it in combination with equal parts of eucalyptus. The aristol is used on account of its antiseptic properties, for I believe it to be one of the best antiseptics. Dr. White suggested this idea to me and I have used it with a great deal of satisfaction ever since.

The next order of business was the reading of a paper by Dr. H. Herbert Johnson, Macon, Ga., on "Forcing Eruption: a Case in Practice," as follows:

Forcing Eruption: a Case in Practice.

By H. HERBERT JOHNSON.

It having occurred to me that there might be enough features of novelty connected with the management of this little case to bring out some points in the treatment of irregularity, I have decided to present it in this short illustrated account. The case consists of one of the slight complications of dentition often produced by the disobedient neglect of patients. This young lady, having no other immediate trouble to force her to pay the usual visit to the dentist, neglected to come until the fifteenth year, when she made a visit for examination and advice.

Fig. 1.

Fig. 2.

On examination I found both deciduous canines in place and quite firm, and the most searching examination I could make did not reveal to a possible certainty the position or even presence of the permanent canines. Knowing that some day, perhaps right in the midst of her young womanhood, these deciduous teeth would loosen and come out, I thought best to extract them at once. Before doing so, however, I decided to inform myself absolutely of the position and presence of the permanent teeth. I therefore had her go to Dr. Thos. P. Hinman, who very kindly made for me some beautifully plain skiagraph views, one of each side of the mouth.

The presence and position of the teeth were now perfectly revealed. The one on the right side was pointing straight for its position, and it was very evident that no trouble would be experienced with that one, as is shown in the skiagraph reproduced in Fig. 1. The one on the left, however, was not in the least assuring. This tooth was lying very flat on the palatal side of the ridge, its crown resting opposite the apex of the lateral incisor, and the end of the root resting nearly opposite the apex of the first bicuspid, as will be seen by reference to the skiagraph, Fig. 2.

The condition of the mouth immediately after extracting the deciduous canines is shown in Fig. 3, and by reference to Fig. 4 the conditions will be seen as they existed after waiting one year, when the permanent canine on the right side had come down to its proper place, while the one on the left had not as yet appeared. It was then determined to cut through and open up the tissues and force it down. I began by making a circular incision of about a half-inch in diameter directly over the crown, taking

FIG. 3.

FIG. 4.

FIG. 5.

Fig. 6.

Fig. 7.

Fig. 8.

out a plug of gum tissue, and using the skiagraph as a guide. I then chiseled away a thin plate of bone exposed by removing the gum tissue, and came directly to the crown of the tooth. The opening was then packed for a few days until the hemorrhage could be checked, when a small hole was drilled into the surface of the crown which presented upward—which when the tooth was righted became the disto-approximal surface. Into this hole was cemented a small iridio-platinum hook for fastening a rubber band.

The little appliance shown at Fig. 5 was then made and cemented into place on the first bicuspid and lateral incisor, making a kind of bar or bridge with a hook in the center, from which a rubber band could be stretched to the hook in the tooth. The result was entirely satisfactory. The tooth came down as promptly as it would have been safe for it to do, or as fast as it would have been possible, to avoid destroying the pulp. After getting it well down with the pulling appliance, to the position which may be seen by reference to Fig. 6, a rest was taken for a while to allow nature to adjust matters.

By means of a jackscrew, extending from and attached to the opposite bicuspids and molars, it was then pushed into its proper position in the arch, as is seen in Figs. 7 and 8. The principal difficulty encountered was in keeping the wound from healing and closing up the opening, thus making it troublesome to adjust the little rubber bands, which had to be renewed quite often.

Discussion.

Dr. S. H. Guilford, Philadelphia, Pa. The operation described and illustrated in the paper was certainly a remarkable one. It is an operation which is not often attempted or successfully performed, but in this case, as shown by the casts, it seems to have been a complete success. It is a difficult operation, because it is hard to get at the tooth in order to attach the appliance, and it is no easy matter to turn the tooth and to lead it to place. It is also sometimes attended with a great deal of danger. I remember that some years ago a case somewhat similar was presented before the Pennsylvania State Dental Society; the operator succeeded in getting the tooth into place, but after he had done this he found that he had stretched the pulp to such an extent as to devitalize it. I would like to know if anything of that kind happened in this case.

Dr. Johnson. No. The pulp is in a healthy condition; but during the operation I found there was some danger from that, and watched it very closely, and when I found the tooth erupting too rapidly, reduced the size of the rubber band so as to decrease the tension on the tooth.

Dr. Guilford. Of course, if it happens that the pulp is devitalized, it is not such a serious matter unless allowed to remain too long in that condition. If as soon as the tooth has come to place it is discovered that the pulp has been devitalized, it can be readily removed, and the tooth not be much worse off, unless slight discoloration should result.

I want to congratulate the essayist on the success of the operation. It is certainly a most commendable thing to bring such a tooth into its normal position and make it useful to the patient. If that had not been done, the other teeth would probably have closed together, with a deformity as the result. In

any case of imprisonment of a tooth, an attempt should be made to bring it into place, because if it is not, the arch will be disarranged, and imperfect occlusion of the teeth be the probable result—something that we want to prevent in all cases.

Dr. C. O. Kimball, New York, N. Y. This case is especially interesting to me because of the success which Dr. Johnson has met with in treating it.

Here I wish to state that eight years ago I had occasion to treat a case precisely similar except that the canine was on the right side. The procedure which Dr. Johnson adopted seems to have been a very wise one, and the similarity of the two cases is my reason for speaking now. When the tooth was first located it was lying in almost the same position as the one described by the essayist, with the apex behind the lateral. Its position was discovered only after making an incision of fully one-eighth of an inch under the surface of the gum. It was difficult at that time to set any band on the tooth, or to determine accurately where it was to be placed. So instead of inserting a band—after satisfying myself as far as I could which would be the palatal aspect of the tooth—I made a little pit under the end of the canine on one side of it, and then, with the removable crib of Dr. Jackson's having a hooked wire spring, which curved around over the outer side and under the place where the deciduous canine was taken out—the hook end of this spring was inserted into this pit, arranging the spring so that it could be sprung off to be cleansed and reinserted. In this manner a continuous downward drawing motion was secured. The tooth yielded very readily and came out into line. We then found that the movement was not sufficiently rapid, and therefore adopted the course followed by Dr. Johnson, of inserting a little loop in the end of the tooth, then pulling in the desired direction to draw it firmly into place. The tooth which has now been in position for seven or eight years is, at the present time, in a normal condition in every respect.

Dr. Johnson's case calls to mind another case which I have to operate upon this fall. It is the case of a young lady one of whose lateral incisors is very crooked and projects considerably over the central. I was at a loss to understand why it had come down in that way, there being no permanent canine on that side. After having had an X ray made I found that the canine was being forced against the root of the lateral incisor. I have been watching the case with the X ray, and we propose to perform the same operation—that is, cutting a retaining point in it and drawing it into position—and we hope for the same success that has attended the operation of our essayist.

The next order of business was the reading of a paper by Dr. W. L. Ellerbeck, Salt Lake City, Utah, entitled "Comments on General Practice."

Dr. Ellerbeck not being present, the paper was read by Dr. A. J. Cottrell, Knoxville, Tenn., as follows:

Comments on General Practice.

By WM. LEON ELLERBECK.

Were we to supply a student taking a correspondence-school course in dentistry, if such a thing were feasible, with the various dental journals from their inception to the present time, containing the writings of "scientific" Tom and "practical" Dick and Harry —offering them as a source of information—what a whirl of indecision and uncertainty he would soon be in as to the proper methods to pursue in almost any dental operation! To begin with, is he to believe that cavity extension to areas of relative immunity as prescribed by some is justifiable, or does this system involve a wanton waste of valuable tooth-structure, as claimed by others?

After having opened into a putrescent pulp, and having cleansed the canal—perhaps having treated with sulfuric acid followed by an alkaline carbonate—should he expect a maximum of good results by immediate root-filling? or is there wisdom in another's advice to first institute a series of daily treatments with medicaments, in order to destroy any pathogenic germs that may have found a pasture in the pericementum? Is the pyorrhea which he will encounter in the mouths of prospective patients merely a filth-disease, and curable, if at all, by local treatment, or are systemic conditions a causative factor, to be met by general treatment? In orthodontic procedures is he to believe that it is right practice to construct a complex lot of apparatus in order to turn a tooth here and push a tooth there, perhaps extracting a tooth or two to simplify?—that "The excessive expansion of the dental arch without extraction results from lack of broad education"? or is he to believe that extraction is a crime, and an attempt to deal with individual teeth fallacious, for the reason that the jaws themselves are primarily at fault and must first be corrected, must be properly expanded, etc., and that in the great majority of cases an adjustment of the articulation is the essential move toward correction?

Shall he use a vacuum chamber in a plate to give stability to the fixture through added suction, or does the employment of this device really interfere with perfect adhesion? Ought he to use soft or non-cohesive gold for stopping cavities, or must the same be used only sparingly, a thin lining at the most being all that is admissible, this to be followed by hard or cohesive gold? Shall he in either event pack the material by mere hand pressure—adaptation being the essential requirement, and great density being not necessary—in fact, great pressure or hard blows being responsible for a great many loose fillings? or shall he believe with others who, admitting the possibility of good adaptation by light packing, yet insist that fillings thus inserted will not stand the masticatory strain or stress but will ultimately tip and leak and consequently fail, and further, that great density is difficult to attain without rigorous malleting, and that fillings of less than a certain degree of density will absorb grease, inviting a recurrence of decay?

Is he to believe that the teeth in certain mouths—particularly in young girls up to the age of puberty—are of soft structure, and that gold for stopping cavities in such is not indicated at all? Also that caries will rapidly recur under such treatment, and that these teeth may best be filled with plastics until they are harder? Or is he to believe that teeth vary only slightly in density from youth to old age; that there is little difference if any in their chemical composition, but that all are practically of the same hardness; that systemic conditions and the matter of peculiar environment are the principal factors in causing caries, and that with proper cavity preparation on scientific lines gold may here be trusted, if properly packed, to best preserve these teeth? Is he to believe that it is foolishness to insert gold fillings in deciduous teeth; or is he to follow the teaching of those who claim that they fill the greater percentage of cavities in deciduous teeth with gold, and get satisfactory results? Is he to believe, as proclaimed by many, that porcelain fillings are a short-lived fad, that "They are not an advance in dentistry, and that no cement will hold them," etc.; or shall he heed the claim of an equal number, who hold that they are when properly done an ideal filling? Is he to band his crowns, or is he not? Shall he or shall he not remove the pulps from teeth preparatory to shell crowning? Shall he extract all four first molars, if one be unavoidably doomed, or extract only its fellow in the same jaw; or shall he leave the remaining three intact and chance any ill results that may follow from change in articulation? And so on, *ad infinitum.*

UNITY OF TEACHING NEEDED.

Throughout the entire field of dentistry, in the very essentials of practice, among the profession at large, there is seemingly little that is settled or agreed upon, and until some such means as the appointment of an international commission, comprised of the ablest, most scientific, and skilled of our profession, be adopted—to recommend to our educators a basis of agreement looking toward the teaching of definite methods and systems of procedure in the various features of dental practice, to follow which will, in their minds, secure a maximum of good results—a wide difference in the merits of the operations of different dentists who have imbibed their instruction under the tuition of different educators must necessarily be expected.

In a recent paper—I believe by Dr. G. Lenox Curtis of New York—I notice the suggestion is made that a prize be offered for the best system of treating alveolar abscess. The suggestion is a good one and should be practically utilized. What dentistry needs above all else is system, and some means of securing adherents to the system. Is the status of dentistry to be based upon that which may be accomplished, or upon the merits of that which is actually done? If upon the former we have reason to feel proud, but if upon the latter, much improvement is necessary.

We are advised to "stop the distracting discontent with our dental schools and our dental educational standards," and to "proclaim that the teachers are right, and that the curriculum is right and the very best in the world," etc. Also, among other things, to help our "export trade." Can we with honesty do this when we note that much of the product is defective? We might recently have lauded the packing plants as utilizing only sound hogs put up by perfectly sound employees, and distributing only high-grade products. It might have

helped the "export trade," albeit it would not have cured the evil. Likewise with our dental colleges; just so long as we find the product imperfect can we hope to better it by honest criticism, and "Though the sword be sharp, it will not wound the innocent."

LOW DEGREE OF OPERATIVE COMPETENCE IN GRADUATES.

There are unquestionably a certain number of dental colleges with high ideals, and with a fair percentage of competent instructors, who graduate a fair percentage of competent dentists. At the same time, it is evident to many that there emanates from some source or sources a vast number of incompetents—at least, judging from the character of dental operations as we see them—in the main. If the deans of all dental colleges were appointed a committee to pass upon the merits of all the operations performed by the various dentists throughout the country, I venture to assert that they would render a report not at all flattering to our pride, viz, that the great majority of the operations would be pronounced inferior. Living in a western community, one of comparatively recent growth, and where there has been a large influx of new people from various parts of the United States, attracted by the many possibilities of investment in mining and manufacture and because of an ideal climate—a panacea for the aches and pains of many who have had poor health elsewhere—I feel that I have had an excellent opportunity to observe the character of dental operations which might be considered as an average of those done throughout the country at large. Were I to report upon all the work I have examined in the mouths of these patients—and I am sure the majority of them have been among those who have never for financial reasons been obliged to seek cheap service—I would say that the greater part of these dental operations were inferiorly done. Certainly, to be liberal, I would say that not over twenty-five per cent. could be classed as either good or excellent, and certainly seventy-five per cent. have shown cavities ill-prepared, gold poorly packed, crowns badly fitted, and generally unsanitary appliances used, little regard having been paid to the artistic element and less to the scientific. In addition to the foregoing, there has been apparent in very many instances an almost criminal neglect of inflammatory conditions. Of course, in such a caustic criticism one might be accused of a certain excess of the ego in constituting himself a judge of what is right, but if so I shall have to stand for that, although feeling that I might be reasonably excused on the ground of having spent considerable time in witnessing the operations of men in various parts of the United States who are generally well known as skilful, and while the comparison may not be made with my own work, it might justly be made with theirs.

LAXITY IN ENTRANCE REQUIREMENTS.

If the work which I have observed is a fair sample of that being done all over the country at large, and is as generally inferior as I have reported—and from consultation with certain men of this and other sections who report a similar finding, I conclude it is—what are the underlying reasons for this state of affairs? What they all are I am unable to tell—would that I might! However, among the things which contribute to this condition, I believe one to be the too plentiful supply of dental colleges, which,

creating a wide scramble for students, necessarily encourages laxness in entrance requirements, notwithstanding arguments to the contrary; also making it necessary to include too many incompetent instructors, and therefore too wide a diversity of opinion among educators under whose tuition our beginners are to be placed. Too many colleges which furnish the means to keep alive and make potent the lamentable influence of the so-called "practical man"—who most often works too much and reads too little, and who pronounces the work and suggestions of certain of our scientific investigators as of little practical importance—are still willing to believe that a certain mechanical aptitude is the essential requirement of a prospective student, criminally encouraging the unfit to take up dentistry.

By the unfit, I mean those lacking an education in the general sciences and in those studies which tend to develop philosophical reasoning, and who in consequence are unable to grasp fundamental scientific principles underlying right dental procedures, lacking which, as Kipling would say (with apologies for distortion), "They do not know, for they could not know, and never will understand." Or, in the wisdom of Confucius: "There are some with whom we may study in common, but we shall find them unable to get along with us to principles. We may go on with them to principles, but we will find them unable to get fixed in those principles; or, if we get fixed in those principles with them, we will find them unable to weigh occurring events along with us."

SCIENTIFIC TRAINING AND APPARATUS ESSENTIAL.

In reality, most of our educators, because of their training along scientific lines, and owing to their better education, are generally more competent to judge of the results of operations than the so-called "practical men," the majority of whom, unfortunately, are neither trained to observe as carefully, nor yet to make the most of their observations. In the light of modern laboratory research, bacteriological, physiological, pathological, mechanical, etc., it would be by no means gross exaggeration to say that the principles of cavity extension to areas of relative immunity; the preparation of cavities on scientific lines—as advocated by Professors Black, Johnson, Kirk, and other scientific educators—and the use of the various filling materials to best meet conditions, etc., might all have been evolved from general scientific considerations, and a fair estimate made of their practical value without the investigator having actually performed a practical filling operation.

We are admonished to read, and read we do, but if we are not to consider the principles evolved through the laboratory test as reliable simply because they were "tried on the dog" first, there is little left for guidance but intuition or preponderance of opinion. Our duty as practical men is to follow more closely the teachings of our scientific investigators, and to put into execution those principles evolved from time to time through the results of their research. The laboratory man might discover the mechanical virtues or physiological action of calomel, aconite, strychnia, digitalis, diphtheric antitoxin, vaccine, etc., but it remains for the physician to put to practical application the findings of the laboratory man.

The diagnostic value of saliva analysis, as indicating systemic conditions, is a closed book to many of us, and yet there

are some making practical use of this medium. The X-ray apparatus for general treatment and diagnostic use seems to many an unnecessary amount of apparatus with which to burden a dental office, and yet it is being successfully employed by quite a number. A cataphoric apparatus takes up too much room, and is considered by many as a worthless time-consumer, and yet when properly used is one of the most efficient means of desensitizing dentin, and in many instances of actually saving time, permitting in fact more thorough and complete operations, and there are still a few of us who recognize its value and make practical use of its effects.

THE QUESTION OF SPEED.

As a practicing dentist, and as one having some considerable respect for my scientific instructors, I wish to say that I agree with many of their teachings, and endeavor, so far as I have facilities and am able to comprehend, to put them to practical use. At the same time, I must here beg to disapprove of the attitude of many of them who seem to impress students with the idea that work to be done well must needs be done slowly; for this is but tending to induce in them mental sluggishness through slow action, thereby lessening the extent of their usefulness, and quite definitely limiting their breadwinning possibilities.

Equally as important to my mind as instruction in paying attention to detail is the instruction of students as to the possibility of performing operations with alacrity and dispatch. It is as much our responsibility to cause as little suffering to our patients through fatigue as it is to perform our work well. The argument is made by certain educators in favor of military training in our public schools, that alacrity in certain gun drills and various company maneuvers tends to increase the student's mental activity. A rather interesting article on "Athletics," by Prof. J. William White of the University of Pennsylvania amply shows that the tendency of physical exercise and of sports requiring quick action is to induce mental activity. To learn to operate quickly, to avoid puttering, besides inducing mental alacrity, will incidentally relieve many dentists from becoming accustomed to, and often even satisfied with, a mere day's wage. I recall one prominent eastern dentist, an educator, who has on a number of occasions informed me of the hours of time he devotes to doing various operations; as, for instance, he may prepare a cavity one day, partially fill it another, complete the packing at another sitting, and may often require another appointment for the finishing, and he is firmly convinced that the same results could not be obtained in any less time. He is conscientious, but mistaken, and the value of his otherwise good teachings is largely offset by his impractical ideas as to time.

I once stood at the chair of a prominent Philadelphia dentist, a clinical demonstrator, for some four or five hours, watching him insert a medium-sized occluso-approximal gold filling, he having on a previous occasion nearly prepared the cavity. He remarked during the process of the operation that he made no attempt to work quickly, and called attention afterward to the fact that he had not dropped a piece or pellet of gold. Incidentally, the gentleman used the cylindrical handle end of an excavator to punch the dam, stretching the rubber over the handle at varying lengths from the end, according to the size hole desired, and then touching a sharp knife blade, a round hole

was produced. This is a pretty but old "stunt." Now, the investment of $3.50 in a dam punch would very nearly have saved itself right there with some men, and if the dropping of a few pellets of gold would have saved a few hours or more time, then this small item of carefulness was very expensive and unnecessarily trying to the patient.

I have stood by the chair of the late Dr. Bonwill, and have seen him obtain just as beautiful a result and a filling just as well packed in considerably less than an hour's time. I have heard Professor Kirk remark that "If a tooth is worth a dam, put it on." Sage advice, in the main, but at what stage is it to be applied? In root-treatments, most frequently at once, but in cavity preparation its early application is by no means necessary. To do so simply means that the operator is obliged to breathe a great deal of infected tooth-dust. A post-mortem examination of the lungs of long-time coal-miners shows, most curiously, the infundibula to be stained to almost an ebony hue from carbon particles. In many of the mills of the mines of the Rocky Mountains, where much crushing of ore is done, the inhalation of fine silicious particles has a bad effect upon the lungs of working men, and I am sure the inhalation of infected tooth-dust has its bad effect on the lungs of many dentists.

USE OF RUBBER DAM.

By those who are believers in "extension for prevention," and who know at a glance in most cases the extent of excavating necessary, much of the cavity preparation may be done without the use of the rubber dam, and I am sure the repeated syringing of débris from the tooth-cavity with warm water is more hygienic than blowing the material into the atmosphere with blasts of warm air. As it is, dentists are generally obliged to breathe too much carbon dioxid and too little ozone, and they owe it to themselves and to their family, in so far as possible, to conserve their health. If the "extension for prevention" principle evolved along scientific lines is a tooth-saver—and clinical evidence is substantiating that fact—it is still further a time-saver; notwithstanding the great cubic content of filling material required, the benefit of the light and room quickly gained, with the ease of insertion, all tend to expedite the work. It is actually annoying to observe some men who, first applying the rubber dam, begin to laboriously bore and scrape, blowing clouds of tooth-dust into the air, wasting time endeavoring to find out the extent of tooth-infection, and bent on conserving certain tooth-substance that caries and you, in the majority of cases, will remove at no far distant date.

USE OF MATRIX FOR APPROXIMAL CAVITIES.

While generally, properly selected chisels are to be relied upon, still in order to expedite work, I frequently do that which I have not seen advocated, but which I believe to be at times good practice, *i.e.* applying the matrix in preparing approximal cavities in bicuspids and molars where we desire a square base and where there are frequent opportunities, unless we proceed slowly, of cutting unevenly, perhaps wounding the gum, and perhaps damaging an approximating filling, or roughening the surface of an approximating tooth. I here use the Ivory matrix-holder and bands, which latter are inexpensive and which are usually spoiled in this procedure; in fact the bur may be severely damaged. But what matters a bur or two, and a band which costs but a

cent or two, as compared with the time saved in expediting the work? By pressing slightly away from the pulp and toward the matrix from side to side, one quickly extends the cavity. A new square-end dentate fissure bur may often be used to advantage. This may be followed by the pear-shaped bur, and in order to get the floor perfectly flat, the inverted cone. The bur is held where one wishes it, and with little danger of inflicting damage to the pulp. The matrix, if not wedged, will be sufficiently yielding to permit of the gingival margin being trimmed evenly.

In the filling of occluso-approximal cavities, I believe there are too few dentists who employ the matrix. In the main, the average dentist will secure better contours, and because of the greater pressure than can be applied generally, better adaptation will be secured than where this appliance is not used. A matrix such as Crenshaw's when properly applied is as useful to the dentist as is the miter-box to a carpenter.

From many trials of inserting gold fillings into a steel matrix, such as employed by Professor Black in his experiments, I am able to testify that if sharp malleting be employed it will prove a great exception if the gold does not press perfectly into each angle, and I doubt if a two-part matrix could be so perfectly constructed as to keep the gold from showing a line where the pieces of steel come together. In a properly prepared cavity it is sheer evidence of lack of skill when one is unable to properly adapt the gold to the walls of the cavity. As to the method of anchoring the first few pellets of gold by burnishing into thin cement at the gingival seat and axial wall to assist anchorage, or using a thin lining of non-cohesive gold or tin, and a small fold arranged over the gingival wall preliminary to applying the matrix, there can be no objection, particularly in molars where there is a broad seat; though most frequently the use of a few tin pellets first loosely pressed over the floor and into the angles, and then condensed under a layer of cohesive gold held at one angle whilst being malleted at another to insure stability, enables one to apply the matrix with safety at once. It seems pretty generally conceded that tin has some intrinsic preservative quality in contact with tooth-bone; certainly this has been my observation. A thin film as a lining is all-sufficient. The pellets supplied by the Rowan Co., and suggested I believe by Dr. W. D. Tracy of New York, are admirably soft and adaptable. Even in small morsal cavities too shallow to line with cement, tin is always my base.

FAILURE IN GOLD FILLINGS DUE TO LOW DENSITY.

So far as my observations have gone, the great percentage of failing gold fillings are those of low density (and it is a curious fact that the over-cautious margin extender seems to be a light gold-packer). Inquiry has revealed that a great many of the failing gold fillings have been done by hand pressure, perhaps using the sponge gold, though as to this latter I cannot state, since patients more often remember how the filling was inserted than the kind of gold used. I have listened to various demonstrators employed by the manufacturers of sponge golds advocating their wares, claiming that fillings may be quickly built and perfectly packed by hand pressure, and by certain special instruments which they also sell. Not that good results are impossible; still I venture to assert that many are careless with this class of gold,

and their method of packing explains many faulty fillings. A lining of tin or of soft gold, if you will, followed by cohesive gold in the great bulk of the filling, packed with good and vigorous blows, wherever possible with the Bonwill mechanical mallet, will produce a filling of the greatest density, of the least pitting, and the best able to stand the masticatory strain or stress. I recall a statement made to me by Dr. Bonwill, that the great majority of dentists did not know how to use his mechanical mallet, as they would not screw it up enough, and that they tapped instead of hitting, and while infrequently there are teeth the pericementum of which seems too sensitive to comfortably stand rigorous blows, yet there are ways of remedying this, and the time taken here in first inserting temporary fillings to relieve this condition is well spent, for the securing of great density through rigorous packing will insure a maximum of good results.

I recall testing a filling that Dr. Joseph Head of Philadelphia had inserted in a steel matrix, using cohesive gold, which showed density of 19.28, nearly equal to that obtainable had the gold been melted. The use of a matrix properly applied permits the approximation of this result in the mouth.

The finishing of occluso-approximal fillings with platinous gold is a method that is, I believe, too little indulged in. It certainly gives a hard finish, and is admirably adapted to withstand the masticatory strain or stress, and yet I believe the manufacturers will agree that no great amount of this material is used.

PORCELAIN.

With regard to gold in anterior teeth, I have little to say, for here I am a strong advocate of porcelain fillings, and feel that this material has come to stay. No more time is required for the preparing of the cavities by one who adopts a systematic method of cavity preparation than for gold; the time for their insertion is much less, the esthetic effects greatly to be preferred, the discomfort to the patient is reduced to a minimum, and the lasting qualities only limited by the ability of the operator.

The average labio- or labio-gingival filling, with proper cavity preparation, and giving anything like reasonable time for the making of the matrix, need not take over twenty to thirty minutes' time to complete, bake, and cement to place.

The dentate pear-shaped burs manufactured by the S. S. White Company are ideal for quickly opening into these cavities, followed by the dentate fissure burs for extending, and by me quickly finished with a special bur which I have had made by the J. W. Ivory Company, being merely a cylindrical plug-finishing bur about the shape and size of the dentate fissure bur, and like it bladed on the end. Cavities can be quickly and perfectly finished with a few movements of this bur, which besides leaving good edges also finishes the base of the cavities perfectly flat.

I have nothing further to offer you in the way of cavity preparation for porcelain fillings—the matter having been so completely covered by others—except to say that I should take issue with such men as Dr. Reeves, who claim that extension to reach free cleansing surfaces is not necessary for porcelain fillings; for if such necessity exists at any time it is still the requirement of the tooth and not the filling material.

CONSTRUCTING PORCELAIN CROWNS.

In the matter of porcelain crown construction, while admitting that by proper preparation of the root, bands may be so constructed as to occasion but slight irritation, and beautifully artistic results may be obtained, and it is my practice in many instances to construct banded crowns for strengthening roots; yet the principle of inlay work applied to such crowns as the Whiteside and the Davis, will secure likewise beautifully artistic results without the possibility of irritation, and porcelain is greatly to be preferred in most cases. The method of fitting such crowns is simple enough, and as follows: Selecting one of the crowns suitable to the case, it is so ground at its cervical portion that when placed upon the pin which has been fitted to the root, and its incisal edge in proper relation with the other teeth, it will not touch the root within one thirty-second of an inch of its labial, and one-sixteenth of an inch of its palatal aspect. The crown and pin are removed and high-heat gutta-percha is arranged around the pin and the neck part of the tooth, within reasonable limits representing the amount of tooth-material to be added. The gutta-percha is slightly warmed and the pin and tooth then forced to place, when with a very thin warm spatula the gutta-percha is trimmed to conform to the root-end—in fact now adjusted so as to represent the amount of porcelain material which is to be added to complete the crown and make it fit perfectly the root-end.

The whole thing is removed, and the tooth with the pin up is invested in plaster to the junction of the porcelain and gutta-percha and low-fusing metal fully trimmed to conform to the edge of this. The pin is now coated with plaster, the rubber ring placed around the pin and gutta-percha, and low-fusing metal poured over it. When cool, this is removed, the pin and gutta-percha drawn out, and, as will be evident, a little cup-shaped depression in the mold will be left, into which platinum inlay foil is carefully burnished just as for a porcelain filling. A hole is pushed through where the pin is to pass, and a little ingenuity in baking and carving enables one to bake this root-end, leaving a hole where the pin can pass through into the body of the tooth. Before removing the platinum, the crown is placed on the platinum matrix over the fused porcelain in its proper relation, and the two are fused together, the platinum thereafter being stripped off, when the tooth placed back upon the root should fit as perfectly as an inlay in a cavity.

GOLD SHELL CROWNS.

While not esthetic, the fact remains that bicuspid roots are frequently gold shell crowned. Now, the average perfectly cylindrical ferrules usually employed are most unsightly. The architectural construction of the buccal cusp of bicuspids shows it to "consist of three stanchions, of which the middle one is most marked," and the examination of many such teeth shows two faint grooves on each side of the middle stanchion or tubercle extending axially. Whether or not the other bicuspids may show this, and often they do not, it is well to produce this in a gold crown—even exaggerate it, for the reason that a polished curved surface shows a streak of white light, and the matter of having three curved surfaces instead of one increases the white light effect two hundred per cent., taking away much of the glamor of gold. Frequently where I have placed

a crown thus made in mouths where perfectly cylindrical crowns on other teeth had been employed, patients have insisted on the other crowns being removed, and supplanted with the "crimped" variety. Certainly where gold crowns must be used, the artistic effect of this method is appreciated.

Frequently there presents in practice the case of the loss of an upper first bicuspid, and the patient is desirous of having a tooth supplied. The canine may be rotated and unsightly, and through excessive filling may be weak, and may be generally such that it seems best to crown it rather than attempt to use it for inlay or for bridge work; the patient, too, with you, being desirous of avoiding in this conspicuous place, at least on the canine, the display of any gold. If it is a case of close bite, or if a lower bicuspid has been permitted to extrude, the construction of a porcelain bridge entirely above is not indicated, because of lack of material to insure sufficient strength, then the application of a combination porcelain and gold bridge becomes desirable. The porcelain crown is constructed for the canine, a platino-iridium bar having first been soldered and extended from the ferrule to a cavity cut in the second bicuspid, either to be held in place by an amalgam or gold filling, or soldered to an inlay made by fusing platinum gold solder in a platinum matrix. The canine crown is finished in the usual manner, the bar or inlay being held during the baking in some investment compound. To secure sufficient strength in the bicuspid facing, it is of course necessary to use a metal tip and backing.

The porcelain crown having been completed, the bicuspid to be supplied is ground to place and backed; the cusp having been made of gold or platinum, it with the tooth is then soldered to the bar. It is evident, however, that a very unclean fixture will be produced unless some means be taken to insure the solder finishing flush with the porcelain. To accomplish this, first arrange some inlay platinum foil along the post-approximal part of the crown, far enough back on the labial side to be invisible unless viewed directly from the side. The bar having been pushed through it, it is brought into contact with the tooth. A little creamy porcelain body having been first smeared on it, it is burnished on the crown and baked so that the solder will flow to the thin platinum foil on the crown, and finished up perfectly, leaving no crevice for the lodgment of the ingesta.

THE TELESCOPE CROWN.

Quite frequently a case presents of the loss of the lower molars on one side. There are several so-called appliances for constructing a removable bridge to supplant these teeth, but most of them are unsatisfactory. The matter of constructing a really serviceable and removable bridge here, to my mind, can be best accomplished by the use of telescope crowns. Where the bicuspids are short, both first and second bicuspids may best be used, but where the bicuspids are long, and there is an opportunity for some considerable retention in the telescope crown, a second bicuspid is all that is necessary, merely using a half-clasp to fit on the first bicuspid to partially take up the strain of lateral movement. The method of telescope crown construction has been so well covered by different authors, that it would be presumptuous for me to take time to describe it in detail. My object in citing this case is merely to show an inexpensive means of supplying teeth by

this fixture, for where those patients are unable to have the remaining part done in porcelain, or to sufficiently compensate one for constructing a gold-rimmed saddle, an inexpensive and thoroughly efficient appliance may be made by the mere soldering of a platinoid bar from the crown to conform to the general curve of the alveolar ridge, to this soldering saddle-back or even plain rubber teeth, and waxing up around the bar and teeth to represent a saddle, to be substituted by vulcanite. Two little chips of gold being soldered to the posterior part of the crown and roughened, permit the rubber to be finished up perfectly so that there will be no unnecessary crevices for food accumulation. I cannot understand why such fixtures are not more generally employed, unless because of the expense incurred by patients in having this appliance constructed with a porcelain or gold-rimmed saddle.

It is true that "The province of dentistry should be to prevent germs from collecting in the mouth, rather than to assist in their formation," and there are altogether too many filth-accumulating appliances inserted. The use of the bridge-plate fixture above described—which may be easily removed and cleansed—is hygienic and mechanically efficient. While some may object to the strain brought to bear on the bicuspid roots, on the theory that they were intended to do the work of only one crown, it does not apply here, for the saddle throws the work largely upon the jaw itself, and besides, the risk might well be taken on account of the material benefit of occlusion to be given to the upper molars.

The method of inlay bridge work is bound to revolutionize fixed appliances, eliminating as it does the irritant band, and thus prolonging the usefulness of the teeth used as abutments. I cannot but think that those who are not perfecting themselves in this method are in danger of becoming in arrears in an important feature of general practice.

REPLANTING OF INCISORS.

Another matter which frequently presents in practice is where a central or lateral incisor through some cause begins to extrude and protrude, spoiling, especially in women, an otherwise pleasant smile; while there often seems to be some pyorrheal indication, yet treatment seems to avail not, and the condition seems to progress, to the great annoyance of both operator and patient. One is wont to grind off the incisal portion to secure harmony, and yet this does not effect a cure. For some time I have adopted the method of extracting these teeth and replanting, and with very satisfactory results. Knowing the ultimate result of delay—general weakening through root-absorption, etc.—I operate on these teeth early.

After preparing the root properly as for general replanting, and—unless there has been considerable infection—using nothing stronger than normal salt solution in which the tooth is held while being prepared, the root-end is slightly trimmed away and smoothed, if honeycombed, the root-socket deepened, and the tooth replaced in normal alignment, and there held until union takes place.

One of the most annoying disfigurements encountered in the mouths of patients is where some disease of infancy has interfered with the nutritive process, and has caused an imperfect calcification of the enamel cap, causing the teeth to be pegged or pitted to a varying extent, according to the severity of the disease and the age at which it occurred. At times

the incisal portion of all or part of the twelve anterior teeth are thus affected, the enamel being quite imperfect, pigmented, and decaying, and in young girls and women especially, porcelain tips are required to correct this unsightly condition and to preserve the balance of the tooth. To resort to jacket crowns as some do may be likened to "using a battle-ax to sever the head of a hen"—unnecessary valor!—and the method of using pins for attaching the tips is not desirable, especially in the teeth of young people. Generally there remains a part of the dentin below the line of affected enamel which is strong even if pigmented, and with care the tooth may be prepared so as to leave a pin-like projection of this dentin to make an excellent dowel with which to anchor a porcelain tip. This may be made after the method of constructing a jacket crown.

RECREATION.

There are many little points with reference to things in practice concerning which I should like to make comment, but this article is long drawn out. In conclusion, then, I will add as a practical phase of dental practice, that while professional dignity is a desideratum in keeping with our great profession, and the matter of too great hilarity in a dental office to be decried, yet I believe there are many who take their work too seriously and who tend to impress their patients with this seriousness, where a certain joviality might lighten both the spirits of the operator and the patient, and in a measure take away the dread of dental operations. One of the best western dentists I have ever known has recently quit practice because of the nervous strain largely induced, I believe, by the over-seriousness with which he took his work. While the matter of abstaining from commercial or business pursuits, and the centering of one's whole thought dentally might tend to make one more careful of the business details of practice, yet I am inclined to feel that in our profession, speaking generally, there is no great opportunity for wealth, and that too close confinement to one particular thing is neither broadening nor helpful; the matter of a little better insight into business conditions and commercial affairs, to enable one to invest his surplus of income over liabilities, and in a general way to present some diversion for mental recreation, is not to be lightly looked upon. At any rate, if through lack of mental discipline one cannot refrain from thinking business during the hours of office practice, and he finds it unwise to risk diversion through business ventures, I still believe that the average dentist will make more money, live a longer and more useful life, by practicing from ten to three continuously, and devoting the remaining part of the day to healthful, recreative pursuits, baths and massage, golf, tennis, driving, etc., than to put in the laborious hours which many do, and which seem momentarily profitable, but which with the great majority lead to mental depression, general ill-health, and early decay.

Discussion.

Dr. A. J. Cottrell, Knoxville, Tenn. I read the paper with a great deal of interest, and there are a few things I would like to say in regard to it. I, like Dr. Ellerbeck, am very much in doubt about many of the things in dentistry. I detect in his paper the thoughts of one who wishes to remove the hindrance of conflicting ideas and theories, and I, also,

would be glad to see the time when some of these theories shall be settled beyond the shadow of a doubt. However, I am not inclined to be pessimistic in this matter, because the theories in regard to dentistry, as in every other great movement—political, educational, religious—are the result of evolution, and no great reform has ever been accomplished at one master-stroke. There are some things that are settled beyond the shadow of a doubt. The question as to whether the idea of "extension for prevention" is good or not is settled, for me. There is no doubt in my mind, nor in the minds of any of us, I think, as to whether there is a use for the porcelain inlay in dentistry; that is settled. Yet there are some problems that cannot be settled, because the personal equation must enter into their solution.

There is not time to discuss the various points in the paper, but I would like to add just a word. We all like to hit at the colleges and the people interested in them. If we can find no one else to criticize we jump on the colleges. We are all bound to admit that a great many of the students who leave dental colleges are not as thoroughly equipped as they should be for the practice of dentistry—that there is room for improvement. This I admit, and we all know it, but there the question of evolution comes in again. I would ask Dr. Ellerbeck, or any of those people who have a weakness for criticizing the colleges, to compare the dental colleges of today with those of two decades ago. Compare them with those of even ten years ago, and the advance is apparent. Consequently I say I am not pessimistic in regard to our system of education. I admit that it is not complete, but those who make education a study are pressing forward rapidly, and in a most conscientious way—doing the best they can; let us give them a word of commendation once in a while, instead of continually ripping them up.

Dr. Wm. Crenshaw, Atlanta, Ga. I think Dr. Ellerbeck has presented us with a very interesting paper, and one which we shall have to read and study before we can properly appreciate it.

He seems to think, in the preamble of his paper, that the colleges do not improve the rank and file of the profession today. Although I am interested in the teaching of dentistry, I believe that what Dr. Ellerbeck intimates is true to a greater extent than the profession realizes.

I believe there is an opportunity in what he suggests as to the feasibility of a commission to settle certain mooted methods of practice. In some schools we find, for example, that they are teaching exclusively the manipulation of cohesive gold, as they consider it the best form of that filling material for saving teeth; while in others the use of soft or non-cohesive gold is advocated as the only correct thing. These methods are so far apart as to results that nothing but confusion in the minds of the students comes of it. Again, for illustration, if each of the physiologists of today were to present as proper teaching for students in medicine and dentistry his own opinion of the circulation of the blood, digestion, and assimilation of food, we would have as many opinions as we have teachers—but they do not do that. These matters are settled by the authorities on the subjects, and although you might employ a half-dozen physiologists, you will find that they all agree with regard to circulation, digestion, and assimilation. Now, when these things are settled,

you can teach something definite, because there is a basis to work on. It needs to be as the law in our courts, under which the lawyers work, which comes from a settled ruling—a head and authority. I regard the suggestion as a good one—good for our profession, and of course for the public at large.

Dr. Ellerbeck states in his paper that cavity preparation on scientific lines is taught by Black, Johnson, Kirk, and others, giving credit for the present prevailing methods of preparation of cavities. These gentlemen have done their part, to be sure, but they have not originated what they are teaching, and it fatigues me somewhat to see this honor constantly misapplied, and the credit of it given to men who have not originated it; for the credit and the very soul of this extension for prevention, and about every feature of cavity preparation worth adopting, is due to Dr. Marshall H. Webb. He did not call his system extension for prevention, but that is what he taught, and the re-vamping of his teaching does not change or improve its principle. Some small modification may have been made of some parts of his work, but Webb is the author of the system, and he should have the credit. I think the commission as contemplated by the essayist would find Webb's work settled, so that, as from the rulings of the Supreme Court, there can be no appeal.

He refers in his paper to the phenomenally rapid operator, and to the phenomenally slow one, instancing the man who prepares a cavity one day, fills it the next, and finishes the filling the third, taking three days to fill the tooth. Now this is ridiculous, and yet there are some operators who make themselves just as ridiculous by operating too rapidly. I have known operators to knock fillings out before finishing them, because of working too fast. Dr. Atkinson, great man that he was, once did this at a clinic. Conservatism will prevent us from working too fast or too slow. More than most specialists, the dentist must give the proper time and attention to his work, or it must inevitably prove a failure.

I think the essayist is rather over-alarmed at the deleterious effects of the dust arising from the excavation of teeth—dust which he intimates lodges in the cells of the lungs of the operator. I judge others by myself, and try to dodge this dust, and give it to the patient, to whom it belongs. Fortunately it is only occasionally that we are exposed to this.

The suggestion of the use of the matrix in guarding against the cutting of the gum is a new idea, and I think a valuable one in the preparation of the gingival surfaces of molars and bicuspids, or at the cervical border of the cavity. This and other valuable thoughts are constantly occurring throughout Dr. Ellerbeck's paper.

With regard to the use of the particular tin cylinders referred to by the essayist, I do not think it good taste to say it, but for history's sake will state that I am the originator of these cylinders. Both the manufacturer, Edward Rowan, and Dr. W. D. Tracy, to whom our essayist refers, will confirm this statement. The difference in these cylinders and those made formerly by Rowan, is that the cylinders I suggested are made of corrugated tin foil. These are softer and more readily adapted to the tooth-structure in connection with any matrix you may choose to employ.

The last thought I shall notice is the condensation of gold. But I shall not attempt to say anything on that portion of the paper dealing with the manufac-

ture of porcelain inlays, bridges, crowns, etc., because these are out of my line of work, and I do not feel I could add anything of value.

In regard to the condensation of gold, I think that there is a limit to it, and that it is entirely possible to over-condense the material. This is more true of the soft than of cohesive gold, and yet I am convinced that over-condensation of cohesive gold destroys the usefulness of the fillings, particularly after leaving the margins, in a larger measure than we are aware.

Dentists of less experience than mine, and particularly those of more, will testify that with reference to soft-gold work, they have extracted teeth that had been filled by such men as Maynard, the Badger brothers, Emerson, and others. These practitioners filled teeth with various preparations of soft gold, and by methods that were not much more than stuffing the teeth, and yet they have been preserved for forty and fifty years.

Dr. A. P. Burkhart, Buffalo, N. Y. I would like to say a few words, and those few words are the outcome of the remarks made by Dr. Crenshaw relative to the filling of teeth in which soft foil may be used. He has well said that many of the fillings placed in many years ago, which can be almost picked out, have preserved the teeth for years. I have in my own mouth fillings that were inserted thirty years ago, in which the gold was put in by hand pressure, and they are doing good service today. I want to say in this connection that in filling, my greatest effort is to exercise pressure against the walls of the tooth. I think a filling of soft foil firmly laid against the walls of a cavity will preserve a tooth longer than an over-malleted filling would. I believe one of the greatest faults of the young men of the profession today is the over-malleting of fillings. The fillings described by Dr. Crenshaw and the methods employed by him and others will produce the best and most lasting results.

The time for adjournment having arrived, the paper by Dr. E. Parmly Brown, New York, on "The Ultimate Outcome of Crown and Bridge Work," was read by title. The paper here follows:

The Ultimate Outcome of Crown and Bridge Work.

By E. PARMLY BROWN.

A struggle of some twoscore years, beginning in the days of the wooden-peg pivot tooth, has eventuated in a system of porcelain crown and bridge work which leaves little or nothing to be desired.

The porcelain system, as now perfected, comprises an eminently practical combination of all the hygienic and artistic features indispensable to the best results. Among these features are strength, cleanliness, truth to nature, simplicity of construction, non-interference with enunciation, and perfect compatibility with the chemistry of the mouth. Such a combination, which may be considered to produce an ideal system, results from the exclusive employment of glazed porcelain and polished precious metals on all surfaces that are either exposed, or placed

in contact with the tissues. Only by the exclusive employment of those materials, —without soldered surfaces—can any part of a crown or bridge denture be placed in contact with the tissues, with any hope of escaping uncleanliness and disease; and it is alone through the close adaptation of a bridge denture to the alveolus that the necessary strength is obtained.

The so-called "self-cleaning spaces" in the frail and unsightly bridges constructed largely of oxidizing and consequently microbe-breeding gold solder, are in the majority of cases diametrically opposite to what the term self-cleansing indicates.

The demand of modern culture is unmistakably for the elimination of gold and the substitution of porcelain wherever practical. Max Bachman, the New York sculptor, thus voices the most refined sentiment: "In only one thing is the beauty of the American girl marred, and that is in her teeth. Gold in the mouth is abhorrent; it is so unnatural, so ugly!"

The crown and bridge work of the future must combine perfect truth to nature with the maximum of strength and cleanliness, and it would appear that these results can be obtained only by the employment of the strongest porcelain fused upon iridio-platinum plate and bar foundations, in connection with bands and caps, sometimes also with crowns of the same material, all invisible in the finished work.

In the face of these facts, the ultimate outcome will surely be that the dentist of the future must supply porcelain bridges as well as porcelain crowns, or be voted a "back number" by his patients and professional brothers; and consequently the college that does not teach the most perfect system will soon fall behind those that are more up-to-date in their teachings.

It is not the writer's present intention to go into the details of porcelain bridge construction, much of which has appeared lately in both foreign and domestic publications. The ground is covered quite thoroughly in the article on the subject in Dr. Roussel's great work, "Traité des Couronnes Artificielles et du Bridge Work" (Paris 1906). The up-to-date history of some interesting cases may be found in *Items of Interest,* January 1906. Several of the cases therein described have since been shown at such meetings as those of the Pennsylvania State Dental Society at Philadelphia and of the New Jersey State Society at Asbury Park last year. One of these has been continually presented for examination by the profession, as in New York this year. It is an upper porcelain bridge of ten teeth permanently anchored by gold fillings, one cap, and two gold crowns, without a break or a loosening filling after seventeen years' wear, the mouth being in a perfectly healthy condition, and the work in every way as perfect as when inserted.

Porcelain bridges may be either removable, or permanently fixed by fillings, caps, or crowns, or some combination of them, depending upon conditions. When crowns are indicated, oxyphosphate cement or one of the gutta-percha cements —including chloro-percha—may be used.

The writer has exhibited throughout this country and in Europe, during the last few years, hundreds of cases of this work, ranging from a single tooth to full dentures, that have been successfully worn for long terms, some of them for over twenty-two years.

The first essential of success is a suffi-

cient number of piers for anchorage. The denture must be so constructed as to take the best advantage of existing conditions. The proper metals; the best teeth; the strongest tooth-bodies and enamel; the proper furnaces for baking, and the means to be observed for preventing defects in the firing, are among the details that insure the perfect product. In over fifty years' close contact with the manufacture of porcelain teeth and continuous gum work, and twenty-five years' daily use of porcelain for crowns and bridges, I can now say that porcelain bridge work is an exact science. One knows when he sees the mouth just what the outcome will be—a perfect reproduction of the lost teeth shaded with the proper pigments to produce any desired effects. With the electric furnace, anxiety is no longer felt as to the danger of gassing the tooth-body, and time is no longer wasted, as with the slow coal or coke furnace, which has to be urged up to the required heat. Touch the button, and in ten or fifteen minutes a small case is fused in the smaller electric furnace; in forty or fifty minutes a full case is fused in the larger furnace.

What is meant by success in any dental work depends upon circumstances. One case would be a success if it only lasted a few years. A full upper denture on two to five roots would be a success in some cases, even if the roots failed to retain the case more than five years, especially where it is important to avoid resorting to a plate for that length of time.

Nearly twenty-five years of constant insertion of porcelain crowns and bridges leave the fact demonstrated that all failures are due to imperfect construction, or to mistakes resulting from faulty diagnosis. In other words, the perfected system and the present improved appliances would have made successes of all the failures, which nevertheless have been a very small percentage of the whole.

Porcelain inlays and the new German cements, that are far ahead of our old cements, give opportunities to eliminate unsightly fillings within the range of visibility and add to the general esthetic effect produced by the more natural porcelain crown and bridge substitutes. Gold fillings where indicated, gold crowns where out of sight, and many gold alloy fillings on the posterior teeth, serve largely in a conservative dental practice, where both the patient and the dentist must be considered from every point of view. The patient's powers of endurance and pocket-book should be taken into account, as well as his time, and the dentist's strength should be conserved.

One result of these crowns and bridges of porcelain is the preservation of the dentist's health, as much of his time is spent in the detail work of fitting and constructing. He moves frequently from chair to bench—a great relief from the hours of constrained position formerly required to restore the teeth with large contour gold fillings.

The system which has the most advantages in utility and art—everything else being equal—must finally be practiced by the entire profession. It cannot be hurried beyond a certain rate by enthusiastic advocates; nor can it be long retained by its opponents—time in disclosing its merits will be the deciding factor. A bridge denture resting firmly on the gum tissue over the alveolar ridge is fast gaining advocates—as time has proved that perfect cleanliness can be secured in ninety-nine cases in a hundred where polished iridio-platinum is properly used and where ordinary care of the teeth is practiced. Two-thirds of the

strain of mastication can be received on the alveolar ridge, if the bridge be properly constructed, thereby lengthening the life of the piers over fifty per cent. more than if so-called self-cleansing spaces were secured.

I have just been examining a full upper case, inserted eighteen months ago on four very loose roots—two bicuspids, one canine, one central—and on a fairly firm molar, and find the case is very firm, much more so than when first inserted. When examined by a dentist, it gave evidence of having originally been placed on a sufficient number of roots firm enough for all purposes.

The chairman, Dr. Burton Lee Thorpe, then declared Section I adjourned *sine die*.

SECTION II:

Operative Dentistry, Nomenclature, Literature, Dental Education, and Allied Subjects.

Chairman—H. E. Roberts, Philadelphia, Pa.
Secretary—C. S. Butler, Buffalo, N. Y.

FIRST DAY—Tuesday, September 18th.

The first meeting of Section II was called to order at 8.30 o'clock Tuesday night, September 18th, by the vice-chairman, Dr. W. R. Clack, Clear Lake, Iowa.

Dr. Butler announced that the chairman of the section was prevented from attending the meeting on account of having all his funds tied up in the bank which failed in Philadelphia recently, and moved that the vice-chairman of the section be instructed to send a telegram of sympathy to Dr. Roberts, and the regrets of the section at his inability to be present.

The motion was carried.

The first order of business was the reading of a paper by Dr. Charles McManus, Hartford, Conn., on "The Remarkable History of the Profession and the Splendid Character of the Men of the Past who Helped to Build It Up"—being the report of the Committee on History—as follows:

The Remarkable History of the Profession, and the Splendid Character of the Men of the Past who Helped to Build It Up.

By CHARLES McMANUS.

I assure you that it requires a certain kind of courage—to call it by no harsher term—to present an historical paper before a meeting of this character. It would seem little less than cruel to take a body of practical dentists, whose thoughts are on the future of their profession, and force them to consider the

state of that calling, if not a thousand, at least hundreds of years ago.

My good friend Dr. Wedelstaedt* has said, "Let us rather work for the future of our profession, its advancement and progress, than to be forever dwelling upon its past history." I thoroughly agree with him, and yet—well, the traditions of the dental art are so interesting, and the men who in all countries and all ages have worked to make modern dentistry possible are so worthy of remembrance that it seems as if every one of the young men, or women, who propose to devote their life to and receive their livelihood from dentistry should at some period of their career be given a chance to study the subject.

In the first report of your Committee on History, made seven years ago it was stated that "In the opinion of your committee it would be well for the future culture of the dental profession if no class were allowed to graduate from any college without receiving the benefit of a short course of lectures on the subject."

So I ask you this evening to listen patiently to what I have to say, to look at the illustrations (which are more human documents than pictures) not as if they were addressed to you, for to some of those present it is a familiar story, but as if they were being offered to the young man beginning the study of his profession.

I shall touch very briefly on our history previous to the time of the great Fauchard, the "father of dental surgery," whose career is so inspiring and the man so worthy of our affectionate remembrance. It will be unnecessary for me to more than mention the early pioneers in America, as their lives and portraits have been presented to you in the journals by Dr. Thorpe, as well as in a paper read by him at your last meeting in Buffalo.

In the limited time at my disposal I can only hope to suggest to you the possibilities of the subject, attempting in an hour to sketch to you what in some detail would require at least three or four lectures. I have selected, out of a collection of several hundreds, about fifty lantern slides of instruments and appliances as well as portraits which add vastly to the interest of the subject when presented before the average dental student. It is the belief of the speaker that, when we can properly impress the lesson of the remarkable history of dentistry and tell of the splendid men who, in all countries, have helped to found and maintain it, it cannot help but have a practical *ethical* value in building up the professional character and self-respect of the young students upon whom dentistry will largely have to depend for its future professional standing.

The speaker then traced the history of the dental art from the earliest records we have of dental medicine given in the papyrus of Ebers, which reaches back as far as 3700 years before Christ, calling particular attention to the various erroneous assertions regarding artificial teeth, and particularly gold fillings said to have been found in the Egyptian mummies, which are *as yet* entirely devoid of foundation. Slides were shown of Phœnician and Etruscan work, and mention was made of the early Greek and Roman writers upon the subject, with illustrations of the various implements and appliances of the time.

Passing on to the middle ages, the Arabians—Rhazes, the initiator of the operation of filling teeth, and Abulcasis

* Trans. St. Louis Congress, vol. iii, p. 26.

(eleventh century), the originator of a systematic prophylaxis—were given due attention. The first complete set of scalers, those of this pious and persistent prophet of prophylaxis, were shown on the screen.

Attention was then called to Giovanni d'Arcoli, who in 1450 was the first to put on record the use of gold for filling teeth, and a brief account given of Ambroise Paré, who has been styled "the foster-father of dental surgery." A rare portrait of Dr. Nathaniel Highmore was shown, as well as one of Van Leeuwenhoek.

Passing on to the eighteenth century, instruments from the work of Pierre Dionis were shown.

Attention was now particularly called to the great dentist Pierre Fauchard, "the father of dental surgery," whose life and works were described and illustrated. Little is known of the early life of this illustrious man, and the exact date of his birth is still a matter of dispute. A disciple of Poteleret, surgeon-in-chief to the king's ships, his early attention was directed to diseases of the mouth and teeth. Viau, an authority on the subject, says that he had tried several mechanical professions, and the knowledge of these was undoubtedly of value to him later in his career. He determined, after practicing in various towns, to test his success on a larger scale, and in 1719 went to Paris, where at this date, and even earlier, there were not only "tooth-pullers" on the Pont Neuf, but also dentists properly so called. Of one of the latter, Monsieur Carméline, Fauchard speaks as an able and celebrated surgeon-dentist. In 1728 appeared Fauchard's great work "The Surgeon Dentist," in two volumes, with over forty full-page illustrations, a number of which were described and shown on the screen. This book was translated into German and published in Berlin in 1733; a second edition appeared in Paris in 1746, and a third appeared, after the author's death, in 1786. It has never been translated into English, which is much to be regretted. Following the usual custom of the time the work begins with a fine portrait of the author. This is interesting for two reasons, the first being that Fauchard is shown to us as a person of distinguished appearance, and this gives us a hint as to the social condition of the better class of dentists in Paris during the reign of Louis XV; and second, because of the Latin verses annexed to the portrait, which Dr. Wm. H. Trueman has cleverly put into English rhyme as follows:

Whilst Fauchard with wise hand and pen
For health and beauty of the teeth contends,
Envy's mad tooth is gnashed in vain;
His noble nature treats it with disdain.

It is the pitiful little human touch which shows us that this man, the grateful friend of the famous Carméline, the friend and dentist of many of the members of the College of Surgery and Faculty of Medicine, had among his own *confrères* a few spiteful and envious detractors. This caused Fauchard in his second edition to state that—

The rumor having been falsely set about that he has abandoned the profession, which rumor cannot have been invented otherwise than by those individuals who, sacrificing honor to interest, would attract to themselves the persons who honor the author with their confidence; he therefore finds it necessary to give warning that he still continues the practice of his art in Paris, in the Rue de la Comédie Française, together with his brother-in-law and sole disciple, M. Duchemin.

Or the Latin verses may, perhaps, refer to the bitter controversy that Croissant de Garengeot—a studious, dull man who is remembered for the key he *didn't* invent—carried on against him.

Space will not permit taking up in detail many of the points in his book referred to. Some of them are very curious. Fauchard did not approve of tooth-brushes, and advises the use of small sponges in their stead. He preferred tin to lead for filling teeth, and did not care much for gold. "Besides," says he, "gold being dear, not everyone can, or will, make the corresponding outlay."

Fauchard has much to say of interest in the chapter in which he treats of the correction of the irregularities of the teeth. He made use of the most simple means, the file, pressure with the fingers, common or silk threads, and little plates of silver and gold. At times for straightening teeth he made use of the pelican and straight forceps, afterward tying the teeth in the normal position. He rarely had recourse to extraction as a means of carrying out dental correction. (Fauchard, vol. ii, p. 87.)

In closing the account of Fauchard the speaker said: "Before leaving this mighty man, I wish to put on record my sincere belief that the day will yet come when some public recognition of the obligation we are under to this great Frenchman will be made, and that a statue of him will be erected in the city of Paris by the grateful contributions of the dentists of America."

After speaking of some of the followers of Fauchard, the history of dentistry in England was taken up. Passing to the first records of the art in our own country, many advertisements of the first practitioners were shown, and the usual account, with portraits, given of Lemaire, Gardette, Flagg, the Greenwoods, Koecker, Hudson, and others. The early history of the profession, the founding of the society, the journal, and the college, was referred to, and a brief account given of Hayden and Harris.

Particular mention was made of the many distinguished dentists of the South, and their portraits were shown on the screen.

In closing, the essayist spoke of the History of Dentistry, by Dr. V. Guerini of Naples, which is now in the hands of the committee, as follows:

This wonderful work is ready for immediate publication as soon as seven hundred dentists out of the 30,000 practitioners in this country evince enough interest in the subject to signify their desire to subscribe to it. Your committee has sent out thousands of circulars to the most progressive dentists in the world; the matter has been widely published in the dental journals, in many cases with editorials, and after many months but about 400 subscriptions have been received. We require at least 300 more to begin the publication of the book. There is no time to lose; this remarkable record of the early history of the dental art must be presented before the record of American dentistry can be properly considered. Is it too much to ask your earnest co-operation with us in this great work?

Discussion.

Dr. J. Y. Crawford, Nashville, Tenn. It affords me a great deal of pleasure to be called upon to say something in commendation of such an exquisite work, from an historical standpoint, as has been

exhibited to us this evening. I would not presume to add anything to the splendid presentation that we have had. It has always afforded me great pleasure to listen to Dr. McManus in the presentation of anything that he has done for dental surgery; and I feel sure that the work he is doing will, one of these days, place his portrait upon the screen to be looked upon by our successors with as much pleasure and pride as we have looked upon the faces that he has exhibited to us tonight. The dental profession is under great obligation to Dr. McManus for this work, for of all the work in the world of a literary character, I have always believed that of the great historian was perhaps submitted to the severest test. All peoples pass upon the merits of the work of the historian—a work that has very much to do with the formation of public sentiment and in placing that estimate upon character that character is entitled to.

I feel that everyone present tonight is giving to this paper that high appreciation which it deserves, and if the spirits of the souls of the departed watch over and take an interest in the affairs of men, what must be the pleasure of those that have been represented upon the screen tonight, when they look down upon this consecrated scene in this southern city, and hear what the essayist has said in honor of their memory! May the essayist continue in his work to create in the hearts of the dental profession of the world a permanent shrine for the memory of these men who have lived so cleanly, and who have done so much to benefit humanity in the past. May all of this be, to the young men who come after us, an inspiration to still higher attainments in the work of our beloved dental profession.

Dr. Burton Lee Thorpe, St. Louis, Mo. I want to say just a word in appreciation of the immense amount of work done and the time which Dr. McManus has spent in gathering this and other data in his possession. I dare say you all realize that he has shown you on the screen only a few pictures of the many in his collection. He has also told you only a few scattered facts regarding the careers of the men whose faces he has shown tonight. They are the men who have made dentistry, not only in America but throughout the world, and to them, professionally speaking, we owe everything that we have in the way of high standing and character as a liberal and respected profession.

I imagine that none of you can quite realize the immense amount of work, time, and money that Dr. McManus has spent in gathering these data. I have done some work along this line, and I assure you that it is a labor of love, and it is to the credit of Dr. McManus that he is willing to work for the honor and the glory of his profession in giving us something in a permanent shape, which we can record as the absolute authentic history of dentistry. No other profession has so little history to its credit as dentistry. We have been negligent in the past and it is only within recent years that we have been able to obtain these historical data in a permanent form, and therefore I can heartily indorse the recommendation made by Dr. McManus, that this association should take it upon itself to do the right and appropriate thing by subscribing to Dr. Guerini's history of ancient dentistry—a most remarkable work done by a most remarkable man, who has had the energy and enthusiasm to devote his time and labor to the gathering of these data, in order to give us an authentic rec-

ord of the true status of dentistry in the ancient times.

No one in the world, to my knowledge, is as happily situated as Dr. Guerini for carrying on this work, living as he does in Naples, the fountain-head of historic lore, where he is surrounded by ancient tombs, museums, and libraries, in which he can collect these facts from the molding and decaying records of ancient dentistry. I hope that our members have the love of the profession at heart, so that everyone will contribute five dollars—which is the price of the subscription—toward the publication of this book under the auspices of this association.

Dr. H. L. Ambler, Cleveland, Ohio. Personally I wish to thank Dr. McManus for presenting this paper, and I think we should all feel that we have learned a great deal this evening, because I know very well there are very few dentists that have ever made any study of the history of the profession. Dr. McManus, and also Dr. Thorpe last year at Buffalo, showed before this association many pictures of pioneer dentists, and told us many interesting things about them, and they should have our thanks, not only for collecting these numerous pictures, but also for gathering the biographical sketches of those whose pictures were exhibited. I have done very little compared to what Drs. Thorpe and McManus have accomplished in this direction, but I can very fully appreciate their work, and can assure you that no one in this room who has not attempted such work can imagine the amount of correspondence, the number of personal interviews, and the traveling expenses involved in it, and for that reason I think these men should have our thanks.

I will simply refer for a moment to one other point of which Dr. McManus spoke, and which was not noticed by any of the other speakers, viz, that every dental college should teach more or less of dental history to its students. I am very fully in accord with that idea, as it is the most appropriate thing in the world to teach students what the pioneers in their profession did. Now, it is plainly evident that it is an easy thing to interest people and to interest students in the study of history. When you can have a picture placed before them, and a biographical sketch read to them, history becomes the easiest subject in the dental curriculum in which to interest students, and every lecturer upon the subject will tell you the same thing. As you are not students here this evening, I will carry the illustration one step farther, and say that this fact is very well demonstrated here, because the attendance this evening is the largest that we have had at any one of our meetings thus far.

The credit of first introducing the study of dental history into the dental college curriculum is due to a gentleman who is present here tonight. The first man to be appointed a professor of dental history is Dr. Cigrand of Chicago. In or about the year 1892 he began to give a course of lectures to the students at the college with which he is connected, and your speaker is the second one who ever took up the subject and gave a course of lectures in a dental college; this was at the Western Reserve University dental department, and since that time I have kept a record of the dental colleges which have paid more or less attention to this subject, and at present there are nine out of about fifty which are teaching dental history, a fact showing that the subject is gaining a hold not only upon the profession but also upon the students, and through them upon the laity. And

what is more appropriate than that the dental student should know something of the history of his profession? What profession can you name that teaches its students nothing concerning its founders and pioneers? You cannot name a single profession—law, art, literature—that does not teach its students something about its history. Now, is it not high time that all the dental colleges should wake up to this fact, and teach their students something of dental history in order to place us on a level with the other professions in that respect? We want to be placed on a higher plane; we want to be on a plane with theology, law, and medicine. If we do, then is not the teaching of history a step in that direction?

Dr. McManus (closing the discussion). I just want to say that this work has not been the labor of any one man, but of a great many, and none have done better work than Dr. Thorpe in publishing in the dental journals the biographies of our early American practitioners.

I was glad that Dr. Ambler spoke of Dr. Cigrand, who is a pioneer in this study; I also think we will all agree that one of the greatest men in connection with historical work in dentistry is Dr. Wm. H. Trueman of Philadelphia. He is the leader of us all, and when we are in doubt and want to know the facts we go to Dr. Trueman. Dr. Kirk, notwithstanding his many other duties, is also very much interested in this work.

In France they have a history of dentistry by Lemerle, and one in Germany by Geist-Jacobi, but there is nothing accessible in English, and that is what we are working for and will have very soon, if the dentists of this country support the effort now being made to publish Guerini's history. I would be ungrateful if I did not express my appreciation of the kind remarks made this evening, even though I cannot quite agree with all of them.

Section II then adjourned until a later session.

SECTION II—Continued.

SECOND DAY—Thursday, September 20th.

The second meeting of Section II was called to order Thursday, September 20th, at 12.30 P.M., by the vice-chairman, Dr. W. R. Clack, Clear Lake, Iowa.

The first order of business was the reading of a paper by Dr. George H. Wilson, Cleveland, Ohio, on "Prosthetic Nomenclature," as follows:

Prosthetic Nomenclature.

By GEORGE H. WILSON.

All agree that dental nomenclature is imperfect; but there is considerable variance of opinion as to how it can best be improved.

As any language consists of the diction of its best authors and teachers, so the phraseology of a profession consists of the diction of its authors and teachers. The permanence of a vocabulary depends upon the accuracy of the formation of words and whether they best express the thought for which they are used. There are words in the dental vocabulary universally used that cannot endure for all time because their literal meaning is entirely foreign to their accepted use. As illustrations "canine" and "arch" are cited. "Canine" is now discarded by a very respectable portion of the profession; later we shall show wherein "arch" is an inappropriate word as now applied.

Modern dentistry is a young profession and still in a formative state, but far enough advanced for much good work to have been done toward perfecting its nomenclature. The work of Dr. Black presented at the Second International Dental Congress in 1893 and the reports of Dr. Guilford and his committee to the American Dental Association in 1895 and 1896 were an excellent foundation for this department of dental education.

There seems to be a lack of courage with some of our most ardent workers in this department of dental knowledge; so much so that they advocate compromise with error for the sake of harmony. (See report of the Committee on Nomenclature in the Transactions of the Fourth International Dental Congress.) There can be no permanence established upon compromise, only time and labor

lost. Therefore any changes advocated to give assurance of endurance must be scientifically considered and must be the very best known to the professional mind. Prejudice, pride, and euphony should all give way to philology; then, and then only, can any permanent work be accomplished.

The argument has been made that we cannot legislate a nomenclature into existence. This is true, but we can do what will be its equivalent in a few years. The National Dental Association and the National Institute of Dental Pedagogics include in their membership the authors and teachers of the profession, therefore a well-considered vocabulary adopted by them will be adopted by the three avenues of education—the schools, the journals, and the writers. After a few years the old, who cannot learn, will have joined their fathers, and the improved vocabulary only will be in existence. If the dental profession has a vocabulary bearing the official stamp of its two national bodies, it will undoubtedly be adopted whenever there is a revision of our standard literary and medical dictionaries.

Appended to this paper [p. 169] is a list of words especially used in prosthesis. They are arranged alphabetically and are marked to show when approved by the Standard and Gould's dictionaries. The pronunciation is that of the N. D. A. committee of 1895-96, as given in their list. If there is a special dental application of the word, credit is given for the definition to the person responsible for its existence, when known by the writer. Many of the words listed need no comment, while others require discussion. The words for special consideration will not be taken up in alphabetical order but as they seem to the writer to group themselves.

Various names have been applied to this department of the profession: Prosthesis, Prosthetic Dentistry, Prothetic Dentistry, Prosthodontia, and Mechanical Dentistry.

Pros'-thes-is—Standard and Gould; *pros'-the-sis*—committee of 1895. Gk. *pros,* to, *tithemi,* to place. Defined: The making of artificial parts and fitting them to the body, as artificial teeth, cork legs, glass eyes, etc.

What authority the committee of 1895 had for changing the pronunciation from "pros'-thes-is" to "pros'-the-sis" does not appear, but certainly it is much easier to pronounce and should be adopted.

This noun was probably long used by the medical profession before it was taken up by the dental, but its use is very limited by the mother profession compared with the dental, therefore it seems no presumption for the latter profession to appropriate and give it a special significance. It is comparatively a short word, and is that generally used throughout the profession, especially in its adjective form, to denote making and inserting artificial dentures. It is a general term, therefore is capable of assuming any shade of meaning the age may require; hence it is the best term yet suggested for this branch of the profession.

Definition: Prosthesis is the science, art, and esthetics of restoring a lost dental organ or organs and associate parts with an artificial substitute. Science is the theoretical knowledge of the subject, art is the skilful doing of the work, and esthetics is the idealizing or harmonizing of the restoration.

The term or name accepted should not be confined to the teeth, because today they are only a small part of what is covered by this department of dentistry. Appliances for cleft palates, dental

splints, and even lips and noses may be required of the dental prosthetist. However, the most important esthetic service the dentist is required to render is to restore the contour and expression of the lower third of the face.

Pros-thet'-ic dentistry. A proper term, but long, and one rarely necessary, especially if the appropriating of "prosthesis" is approved.

Pro-thet'-ic dentistry. "Pro-thet'-ic," adjective form of "proth-es-is," Gk. *pro,* before, *tithemi,* to place. A term rarely used, and it should not be put in the dental vocabulary.

Pros"-tho-don'-tia. From two Greek words, *prosthesis* and *odontia,* meaning "to place" "tooth," but as applied to dentistry the word is made to cover all work done by the prosthetist.

The derivative is good, but literally it calls attention to the smaller part of that to which it is applied; therefore it is misleading and tends to make ignoble this most complicated and difficult part of our profession.

Mechanical dentistry. The first name given to prosthetic dentistry; but it should now be restricted to the work done in the laboratory, whether for the prosthetist, orthodontist, or operator. The mechanical dentist works for the dentist, not for the patient.

"Cast" and "model" are terms that deserve careful consideration.

Cast. The Standard Dictionary defines cast, under the heading mechanics, as "A reverse copy, in plaster of Paris or similar material, of a mold; usually distinguished from a *casting,* which is of iron or other metal or alloy. An object founded or run in or as in a mold, as of metal, plaster, wax, etc."

In dentistry, "cast" may be defined as: A reproduction in plaster of Paris or its compounds of an object, or part, made from an impression or mold. Casts are used to give their negative likeness to an artificial denture, while a "model" is to produce a positive likeness.

Model. From Lat. *modus,* measure. An object representing accurately something to be made or already existing. A material pattern of natural, heroic, or diminutive size. In sculpture, the plaster or clay original of a work to be executed in stone or metal. One who does duty as a copy or pattern for painters or sculptors. A sculptor may idealize his living model; but his workmen must exactly copy the model he has made in clay. (Standard Dictionary.)

In dentistry: A plaster model is used to make a metal casting or die. Wax models are to be reproduced, or their outlines retained in the completed work. Models are extensively used in technic work. Plaster models are never used in vulcanite work. "Model" is often improperly used for "cast."

Dental arch. The term applied to the curve made by the upper or lower teeth.

"Arch" is not an appropriate term to be applied to the alinement of the dental armament, because when the teeth are in normal use they are in a horizontal position, while arch conveys the idea of perpendicularity, and is too often applied to the vault of the mouth. The writer would suggest, as a substitute for "dental arch," *dental curve.* A curve is a line continuously bent so that no portion is straight; a line that everywhere changes its course. In medicine, "curve" is used once—"curve of Carus" (in obstetrics).

Dental curve would be defined thus: The curve or bow formed by the alinement of the teeth. The different por-

tions of the dental curve would be called and described as—

Alinement curve. The line passing through the center of the teeth mesio-distally.

Labial curve. From cuspid to cuspid.

Buccal curve. Buccal surface from the cuspid to the distal surface of the third molar.

Compensating curve. Occlusal surface of bicuspids and molars.

"Curve" would better convey the idea of an imaginary line; when "arch" is used, too often the teeth or even the alveolar process is meant, instead of the line described by the teeth.

Cuspid. This is an anatomical term, but because of its great importance in teaching and practicing prosthesis it seems apropos to discuss it in this place. "Cuspid" is derived from Lat. *cuspis,* point, and is applied to the four conical or pointed teeth. The name is descriptive and not confusing, it is short and not offensive to refined taste. It is certainly the most desirable one of the four names struggling for an existence—cuspid, cuspidati, canine, and eye-tooth. It is true that our standard anatomists cling quite tenaciously to some of the terms of the dark ages, but that is no reason why a modern science should adopt a faulty diction when a better one may be had for the choosing. Many of the schools are today using the term exclusively; it is quite possible that cuspid is more extensively used by the profession today than canine. If the term cuspid be adopted as the name for the third tooth from the median line in the dental armament, then consistency will require that we shall call the eminence and fossa cuspid; but the terms will be self-explanatory, so that no real objection can be urged upon that score.

Dummy. In common use in the dental profession as a name for the substituted teeth in a bridge. The word dummy is not found in the vocabulary of Gould's Medical or Harris' Dental dictionaries, nor is the word given a dental significance in the Standard. As applied it is a meaningless and clumsy term.

At the 1905 meeting of the National Dental Association, Dr. W. Storer How used and indorsed the term *Substitute,* and its abbreviated form "sub," for the teeth filling the span of a bridge. This term is certainly worthy of consideration.

Flasking. In cast-metal dentures the cast and model plate are incased in a flask with a suitable compound; in vulcanite and celluloid work the cast and model plate are incased in a flask with plaster of Paris, and this is called flasking and the work is said to be "flasked." Solder work incased in a protecting substance without a flask is said to be "invested."

Flexible vulcanite. The 1896 committee preferred "flexible vulcanite" to "velum rubber," and defined it as: Vulcanite which is soft and extremely pliable after vulcanization, containing less sulfur than hard vulcanite.

All rubber when perfectly vulcanized is more or less flexible, therefore the term "flexible vulcanite" is confusing. "Velum rubber" before the application of heat, and "velum vulcanite" after the application of heat, leaves no question in the mind of the dentist as to what is meant, and, it seems to the writer, should be accepted as the choice until something better is suggested.

The committee of 1896 included in their definition, "and being vulcanized at a lower temperature than hard rubber." This implies a mistaken idea, as the temperature in vulcanizing either

variety should be the same—the thickening of the mass, only, governing the temperature. The velum rubber will require less time to be converted into vulcanite because there is less sulfur to combine with the hydrocarbon; but no harm is done if the velum rubber be subjected to heat the full length of time required for hard vulcanite.

Impression. An imprint of the edentulous ridges and palate, or teeth, in some suitable material, such as beeswax, modeling compound, or plaster of Paris. (Com. 1896.)

A new definition of *impression:* A negative likeness of an object or part taken in a plastic material, from which a cast or positive likeness may be produced.

Impression tray. "Tray" preferred to "cup." "Cup" conveys the idea of symmetry of form with a base on which to stand, and holding capacity; while "tray" conveys the idea of indefinite form, a utensil having flanges, and capacity to hold and carry.

Line. Any slender mark or band.

Median line. An imaginary line on the surface of the body between opposite symmetrical halves. The middle line dividing the teeth. (Black.)

Lip line. The line defined by the lips closed and at rest.

High lip line. The line defined by the upper lip when elevated to the extreme by muscular action.

Low lip line. The line defined by the lower lip when depressed to the extreme by muscular action.

Maxillary. Pertaining to the maxillæ or jaws.

Maxillary surface. The surface of a tray, impression, or artificial denture that rests upon the maxillæ, either upper or lower. (O. A. Weiss.)

Abutment. In mechanics, any relatively immovable part. Dental: The anchor tooth for a bridge. Preferred to "pier" or "anchor."

Abutment crown. The part of a bridge attached to the abutment. Preferred to "anchor" or "pier" crown.

Abutment used as a noun refers to that *to which* the bridge is attached; the adjective refers to that *by which* the bridge is attached.

Porcelain (pōrs′-lān). Pottery is divided into three classes—earthenware, stoneware, and porcelain. Porcelain is subdivided into three classes—hard, natural soft, and artificial soft. Dental porcelain belongs to the subdivision *hard* porcelain. Hard porcelain is kaolin and quartz with a feldspathic glaze.

Dental porcelain may be defined as: A solidified suspension of one or more unfused silicious substances in a fused silicate.

Porcelain is high- or low-fusing, dependent upon the quantity and quality of its basic ingredient. Any hard porcelain becomes glass when there is fusion of all its essential constituents.

Sweat. To send forth, exude, or perspire. Applied in dentistry to the uniting of two pieces of metal by heating and without solder. It is not euphonious, but describes the operation.

Autogenous (au-tog′-en-us). Gk., self-producing. The method of soldering to which this term is applied is brought about by high heat, therefore is not self-producing. This term was preferred by Dr. Guilford in his paper on Nomenclature at the Fourth International Dental Congress.

Weld. To unite or consolidate. This term implies uniting with force, either with or without heat. It should not be used as synonymous with sweating and autogenous soldering.

While the words are not pleasing, the writer believes that "sweat" and "sweating" are the best, because they describe the operation.

Resorption. A term that should be used by the prosthetist, and not "absorption" of the alveolar process. Absorption is best applied to the physiological process of adding nourishment, while resorption best describes the pathological and physiological processes of removing waste tissue.

VOCABULARY.

[St. = Standard Dict. G. = Gould's Med. Dict.]

Absorption. [St., G.] *Absorb*, to drink in or suck up. *Absorption*, the act or process of absorbing; the condition of being absorbed. —*St.*

The process whereby nourishment, medicine, morbid products of tissue metamorphosis, etc., are taken up by the lymphatics and various systems.—*Gould.*

Preference is given to *absorption* for taking up nourishment, and *resorption* for taking up waste products. (See *Resorption.*)

Abutment. [St.] Arch.: A supporting or buttressing structure to sustain lateral pressure. Mech.: Any relatively immovable part.

The anchorage tooth for a bridge.—*W.* (Preferred to *Pier*, which see.)

Adhesion. [St.] Physics: A molecular force, or the result of it, by which certain bodies stick together.

The force that retains full upper dentures without vacuum chambers.

Air-chamber. [St.] A chamber or inclosed space containing air.

Improperly used for vacuum chamber in artificial dentures.

Alinement (1), *Alignment* (2). [Both forms, Cent. and St.] The line to which adjustment is made.

Orderly arrangement of the teeth.—*W.*

Alloy. [St., G.] A compound or mixture of two or more metals; commonly restricted to compounds of metals produced by heat. —*Com. 1895.*

A compound of two or more materials by fusion. The least valuable of two or more metals that are fused together.—*Gould.*

Anterior. [St., G.] Applied to the six front teeth in either jaw. Preferred to "oral."

Arch. [St.] In dentistry applied to the curve made by the upper or lower teeth. Sometimes wrongly applied to the vault. (See *Curve.*)

Articulate. [St.] To join together.

Articulation. [St.] Any form of a joint; the union forming a joint, as of bones.

Special: To so arrange the artificial teeth as to accommodate the various positions in the mouth, or "anatomical articulation."

Articulator. [St.] A dentist's apparatus to secure correct articulation in artificial teeth. (See *Occlude.*)

Artificer. [St.] One who constructs, especially with skill; a handicraftsman; mechanic. Artificer preferred to "mechanical man."—*W.*

Artificial crown. A crown of either porcelain or metal, or both; to be adjusted upon the root of a natural tooth.—*Com. 1896.*

Artificial teeth. A dentist's imitation of natural teeth.—*Com. 1896.*

Artificial velum. An appliance composed of flexible vulcanite, used in the mechanical treatment of fissures of the soft palate.

Asbestos. [St.] A fibrous silicate of calcium and magnesium.—*Com. 1896.*

Autogenous. [G.] (Gk., self-producing.—*Gould.*)

Applied in dentistry to uniting metal without solder. Preferred by Dr. Guilford. (See *Weld* and *Sweat.*)

Babbitt metal. Dental formula (Haskell): Sn 8, Cu 1, Sb 2 parts.

Band. A thin metal hoop used to encircle a natural tooth or root.—*Com. 1896.*

Base metal. [St.] Com. 1896. Not of the noble metals. Any metal except Hg, Au, Ag, and the Pt group.—*W.*

Base-plate. That part of an artificial denture which supports the artificial teeth and to which they are attached.—*Com. 1896.*

A foundation next to the gum, for artificial teeth.—*St.*

Bellows. [St.] An implement for creating a blast of air.

Bite. [G.] The act of biting. Seizure with the teeth or mouth. (Anglo-Saxon root meant *split.*) Applied in dentistry to a

plastic material which has the imprint of the teeth or gums of both jaws; used in constructing artificial dentures. (Inelegant term.)

Bridge. [G.] *Bridge work*—The adaptation of artificial crowns of teeth to and over spaces made by the loss of natural teeth, by connecting such crowns to natural teeth or roots for anchorage by means of a bridge, and thereby dispensing with plates covering more or less of the roof of the mouth and alveolar ridge.—*Gould.*

A method of dental substitution that does away with the customary base-plate, the artificial teeth spanning the edentulous space with attachments to natural teeth at one or both ends of the space.—*Com. 1896.*

Bridges are "fixed" or "removable."

Bridges are attached to *abutments* by—Bands; crowns; open-faced crowns; bars; inlays; hoods; pin-and-sockets; telescope crowns; lugs.

Bridges are sometimes supported by "abutment saddles."

Bridges are—Porcelain; gold with porcelain facing; all gold.

Caoutchouc. [St.] Indian name for india-rubber. A hydrocarbon. When combined with sulfur and subjected to heat it is converted into vulcanite.

Cap crown. Synonymous with shell crown. Given by Com. 1896. It should be dropped from dental nomenclature.—*W.*

Carat. [St.] A twenty-fourth part. *Carat* is the spelling preferred by S., C., E., W., Wr., Imperial, etc., and fifty of the fifty-seven Advisory Committee.

Karat—C., 2d choice; Dr. Butler and Melvil Dewey give it first choice. It seems best to adhere to *carat.*

Carborundum. Com. 1896. Carbide of silicon, SiC. (Not in Gould's dictionary 1896 or Standard 1899.)

Cast. [St.] (Verb, To shape in a mold; make a cast of.) A reverse copy, in plaster of Paris or similar material, of a mold; usually distinguished from a *casting,* which is of iron or other metal or alloy. The material run into molds at one operation.—*St.*

In dentistry: A reproduction in plaster or its compounds of an object, or part, made from an impression or mold. Casts are used to give their negative likeness to an artificial denture, while a model is used to produce a positive likeness. (See *Model.*)

Celluloid. [St., G.] Made by subjecting gun-cotton (pyroxylin) mixed with camphor to hydraulic pressure. An imitative substitute for ivory. Other names are "Rose pearl," "Zylonite," "Pyroxylin," etc. Sometimes used as a base for artificial dentures.

Clasp. [St., G.] A piece of spring metal, usually platinous gold, adjusted to three sides of a tooth with one or both ends free, and designed to support partial dentures or other apparatus to be worn in the mouth.—*Com. 1896.*

Collar crown. [G.] An artificial tooth-crown mounted upon and attached to a base composed of a metal ferrule and cap, and designed to cover and rest upon a natural root.—*Com. 1896.*

Preferred name for the crown often called the Richmond crown.

Contour. Con-tour′—S., C., E., W., Wr., Imp.; con′-tour—C., 2d. The line bounding a figure or body.

In prosthesis (verb): To make the normal or natural outlines of a tooth; or to construct a denture so as to restore the normal or natural outline of the contiguous soft tissues.

Corundum. [St.] A very hard native crystalline alumina.

Counter-die. [St.] The reverse image of a die. Usually made of a softer and lower-fusing metal than the die.

Cross-pin teeth. Artificial teeth in which the pins are arranged parallel with the transverse diameter of the teeth. In contradistinction to *straight-pin* teeth. (See *Teeth*—straight-pin.)

Crown. [G.] The exposed portion of a tooth.

Artificial crown: A restoration of the crown of a tooth with porcelain, metal, or a combination of the two.

Crowns are—Porcelain; porcelain jacket; metal—shell (seamless, sectional, or in two pieces); solid; porcelain-faced.

Crowns are—Collar; dowel; collar and dowel.

Sectional shell crowns consist of—Band

(lap or butt joint) and cap—die-and-counter swaged; carved and swaged; die-plate swaged; cast.

Crowns have—Attached or fixed dowels; detached dowels.

(Dowel-pin is the same as dowel.—*St.*)

Curve. [St., G.] A line continuously bent so that no portion is straight; a line that everywhere changes its course.

Dental curve. Defined: Curve or bow of the teeth. The different portions of the curve would be called and described thus:

Alinement curve. The line passing through the center of the teeth mesio-distally.

Labial curve. From distal surface of cuspid to distal surface of cuspid.

Buccal curve. From cuspid to distal surface of third molar.

Compensating curve. Occlusal surface of bicuspids and molars.

Die. [St.] A facsimile of the form of the mouth in cast metal from which a metal blank is stamped to fit the mouth.—*Com. 1896.*

Die-plate. A metal stamp or die used for forming the cusps on shell crowns.—*Com. 1896.*

Denture. [St., G.] The teeth of an animal collectively.

Special: A single set of artificial teeth. Full denture, a double set of artificial teeth, one for each jaw.—*Com. 1895.*

Dowel. [St.] Special: A pin or peg (usually of metal) used for joining an artificial crown to the root of a natural tooth.—*Com. 1896.*

Draw-plate. [St.] A perforated steel plate with holes of a gradually diminishing size, used to reduce the size of wire and metal tubing.

Dummy. [St.] An object made to represent something else externally or superficially.

Special: A tooth in a bridge to supply a missing natural tooth.—*W.* See *Substitute.*

Ferrule. [St., G.] A metallic ring or cap applied to the end of the root or crown of a natural tooth to strengthen it.—*Com. 1896.*

A metallic ring or hoop slipping firmly over a natural tooth as a support for a partial denture.—*W.*

Flame. Gaseous matter heated to a state of luminosity.

Flame is—Yellow (carbon heated to incandescence) or blue (usually the carbon oxidation is complete, or no carbon is present).

Flame may be—Brush, broad-sheet, or pointed, round-tapering; oxidizing (the end of the flame); deoxidizing or reducing (just in advance of the hollow portion of the flame).

Flask. [St., G.] Special: A metal (iron, brass or bronze) rim or box of special design, used to hold the mold for dies, cast and vulcanite work.—*W.*

Flasking. Special: In cast-metal dentures the cast and model plate are incased in a flask with a suitable incasing compound; in vulcanite and celluloid work the cast and model plate are incased in a flask, usually with plaster of Paris; this is called flasking. Solder work incased in a protecting substance without a flask is said to be invested. (See *Invest.*)

Flexible vulcanite. Vulcanite which is soft and extremely pliable after vulcanization, containing less sulfur than hard vulcanite. —*Com. 1896.* The committee preferred "flexible vulcanite" to "velum rubber."

As all hard vulcanite is somewhat flexible, "flexible vulcanite" does not convey a definite idea, therefore is not well named. As "velum rubber" is a definite preparation containing about one-third the amount of sulfur entering into hard vulcanite, and as it is the only variety of soft pliable vulcanite used in dentistry, it seems to the writer that it is preferable to use the term "velum rubber" before the material is subjected to the vulcanizing heat, and "velum vulcanite" after being acted upon by heat.

Flux. [St., G.] A material such as borax or alkali, that will dissolve metallic oxids and promote the fusion of metals.

Fusible alloy. Any alloy, but usually one containing bismuth and melting at a very low temperature.

Gage (1), *gauge* (2). An instrument for measuring or indicating capacity, quantity, dimensions, etc.

St. and Cent. both give *gage* as first choice.

Gum-teeth. Artificial teeth with a porcelain gum extending above the crown. (Preferred by Com. 1896.)

"Section teeth" are block teeth.

Hard solder. [St.] Any solder that melts at or above a red heat.

Impression. [St., G.] Special: An imprint of the edentulous ridges and palate or teeth in some suitable material, such as beeswax, modeling compound, or plaster of Paris.—*Com. 1896.*

A negative likeness of an object or part taken in a plastic material from which a cast or positive likeness may be produced. —*W.*

Impression tray or *cup.* [St.] A dentist's tray or cup used for holding the impression material while taking an impression of the mouth or teeth.—*Com. 1896.*

Cup conveys the idea of symmetry of form with a base on which to stand, and holding capacity; while *tray* conveys the idea of indefinite form, a utensil having flanges and a capacity to hold and carry. *Tray* is the better term.—*W.*

Ingot. [St.] A mass of molten metal cast in a mold.

Ingot-mold. [St., G.] A flask in which molten metal is cast into blocks or ingots.

Invest. [St., G.] To put a covering upon.

Investing. [St., G.] Participle of *invest.*

Investment. [St.] The material used for covering.

Special: Used in connection with solder work. Where the incasement is in a metal flask (as in vulcanite and cast work) use "flask" or "flasked." (See *Flask.*)

Iridium. [St.] Metal of the platinum group. The hardest metal known.

Iridio-platinum, Platinum-iridium. Alloy of the two metals, usually about 10 per cent. iridium to 90 per cent. platinum.

Joint. [St.] The place, point, line, or surface where two or more things are joined together. Joints are either "lap" or "butt." (See *Crown*—sectional.)

Labial. [St., G.] Pertaining to, or toward the lips.—*Black.*

Special: Outer surface of either upper or lower artificial denture, extending from the distal surface of one cuspid to the distal surface of the opposite one.—*W.*

Line. [St.] Any slender mark or band.

Median line. [St.] An imaginary line on the surface of the body between opposite symmetrical halves. (The middle line dividing the teeth.—*Black.*)

Lip line. The line defined by the lips closed and at rest.

High lip line. The line defined by the upper lip when elevated to the extreme by muscular action.

Low lip line. The line defined by the lower lip when depressed to the extreme by muscular action.

Lingual. [St., G.] Situated near or toward the tongue.

Special: The entire surface of either the upper or lower artificial denture next to the tongue.—*W.*

The term palatine surface should not be used.—*W.* (See *Maxillary.*)

Long bite teeth. Artificial teeth with the pins considerably removed from the incisal surface, permitting a considerable overlap of the opposing teeth.—*Com. 1896.*

Lower. [St.] Situated below a recognized level. Applied in dentistry to the lower jaw, teeth, lip, artificial denture, etc. Not "inferior."

Maxillary. [St., G.] Pertaining to the maxillæ or jaws.

Special: *Maxillary surface.* The surface of a tray, impression, or artificial denture that rests upon the maxillæ, either upper or lower.—*Weiss.*

Mechanical. [St., G.] Of or pertaining to mechanics on the physical side.

Mechanical dentist. A dentist confining himself to laboratory work. Not an operator, prosthetist, or orthodontist.—*W.*

Mold (preferred to *mould*). (Verb, the act of forming a matrix for a casting.) The form or matrix for shaping anything in a fluid or plastic condition.

Model. [St., G.] (Lat. *modus,* measure.) An object representing accurately something to be made or already existing. A material pattern of natural, heroic, or diminutive size. Sculpture: The plaster or clay original of a work to be executed in stone or metal; a person who does duty as a copy or pattern for painters or sculptors. A sculptor may idealize his living model; but his workman must exactly copy the model he has made in clay.

Special: In dentistry a plaster model is used to make a metal casting or die.

Wax models, which are to be reproduced, or the outlines retained in the complete

work. Models are extensively used in technic work. Plaster models are never used in vulcanite work. "Model" is often improperly used for *cast* (which see).

Modeling compound. A material for taking impressions, consisting of a gum (as dammar, cowdie, or copal), stearin, and French chalk.

Moldine. A compound of potter's clay and glycerin used for taking impressions.—*Gorgas.*

Noble metal. [St.] A metal which does not unite with oxygen when exposed to the air or a red heat. (See *Base metal.*)

Obturator. [G.] That which closes a cavity. Dental obturator, an instrument made of metal or hard vulcanite, for an opening in the roof of the mouth. (See *Velum.*)

Occlude. To strike against, or close; as the upper and lower teeth in a hinge-joint articulator.—*Black.* (See *Articulate.*)

Oxidizing flame. (See *Flame.*)

Periphery. [St., G.] Special: The outer edge of the base-plate of an artificial denture.—*W.*

Pier. [St.] From Gk. *petra*, a rock. It conveys the idea of a built-up mass as a support.

Preference given to *Abutment.*

Plain teeth. Artificial teeth without porcelain gum extension.

Plaster of Paris. [St., G.] Calcined gypsum. Used in making impressions, casts, models, etc.

Plate. A flat, extended, rigid body, as of metal.

Special: The base upon which artificial teeth are mounted.

Plate-teeth. Artificial teeth with headless pins, designed for metal backing and soldering.

Platinized gold. Gold plate covered on one or both sides with platinum.—*Com. 1896.*

Platinous gold. Gold containing a small percentage of platinum, often called "clasp gold."—*Com. 1896.*

Platinous silver. Silver containing a small amount of platinum. In England known as "dental alloy."

Porcelain. [St., G.] (Porce'-lain.) Pottery is divided into three classes—earthenware, stoneware, and porcelain. Porcelain is subdivided into three classes—hard, natural soft, and artificial soft. Dental porcelain belongs to the subdivision "hard porcelain." Hard porcelain is kaolin and quartz with a feldspathic glaze.

Dental porcelain may be defined as: A solidified suspension of one or more unfused silicious substances in a fused silicate.—*W.* Porcelain is high- or low-fusing dependent upon the quality and quantity of the basic (alkali) ingredient. Any porcelain becomes glass when there is a fusion of all of its necessary constituents.

Post. [St.] An upright piece of timber, metal, or other material, used as a support. Used synonymously with "dowel," but dowel is the preferred term. (See *Dowel.*)

Prosthesis. [St., G.] (Pros'-thes-is, St. and G.; pros'-the-sis, Com. 1895. From Gk. *pro* or *pros*, and *tithemi*, to place.) The replacing with an artificial substitute a lost part or organ.

Special: The science, art, and esthetics of restoring a lost dental organ or organs and associate parts with an artificial substitute.—*W.*

Prosthodontia. (From two Greek words meaning, "to replace teeth.")

While the word is perfectly formed, it is too restricted in its meaning and conveys a very erroneous and detrimental idea; therefore it should be banished from dental nomenclature.

Reducing flame. [St.] The inner portion of a blow-pipe flame that will reduce metallic oxids or metallic salts to a molten metal button. (See *Flame.*)

Relief. [St.] Special: A space created upon the maxillary surface of an artificial denture to keep it from resting unduly upon the hard tissues.

Removable. (See *Bridge.*)

Resorption. [St., G.] The taking up through the action of absorbent vessels, of tissue already formed.—*St.*

The alveolar process is resorbed, or removed by resorption. (See *Absorption*—also text. page 169.)

Retention of artificial dentures. By—Adhesion by contact; atmospheric pressure; clasps; clamps; ferrules; spiral springs; spring plates.

Rubber. [St., G.] A name for unvulcanized caoutchouc.

Ruga and *Raphe.* [St., G.] *Ruga*, pl. *æ.*

The lateral folds or ridges in the anterior portion of the vault of the mouth.

Raphe. Applied to the ridge in the median line of the vault of the mouth.

Section or *section teeth.* [St.] Blocks of one or more teeth with pink gum attachment.

Shell crown. See *Crown.*

Short-bite teeth. Porcelain teeth with pins arranged near the incisal edge of the tooth, which arrangement allows only a short lap over the opposing teeth.

Soft solder. [St.] A solder which melts below a red heat, usually restricted to alloys of tin and lead.

Solder. [St.] A fusible alloy used for joining two metallic substances or surfaces.

Soldering block. [St.] A support for holding the work while soldering.

Soldering flame. [St.] Same as reducing flame.

Soldering iron. [St.] A tool with which soft solder is melted and applied.

Spence compound. A compound of plaster of Paris, Portland cement, and sand. Used for making hard casts for vulcanite, etc.

Splint, dental. Special: An appliance made of metal or vulcanite for supporting either a fractured maxilla or mandible.

Splint, interdental. Special: An appliance made of metal or vulcanite and placed between the jaws to support a fracture of either the maxilla or mandible, or both.

Straight-pin teeth. Artificial teeth with the pins arranged in a line parallel with the long axis of the tooth.—*Com. 1896.*

Substitute. [St., G.] That which takes the place or serves in lieu of another. A term preferred by Dr. W. Storer How to "dummy," in bridge work.

It is a much more expressive and desirable term, and should be adopted by the profession.—*W.*

Suction plate. [St.] (Lat. *sugo,* to suck.) The term is neither euphonious nor well applied. A better term would be *pressure plate.*—*W.*

Surface. The surfaces of an artificial denture are—Labial, buccal, lingual, and maxillary.—*W.*

Swage. [St.] Special: To shape between a die and counter-die.—*Com. 1895.*

Sweat. [St.] To send forth, exude, or perspire. "Sweating" used synonymously with "autogenous." Not euphonious, but best describes the process.—*W.*

Teeth, artificial. Forms or kinds of artificial teeth:

Tube. A tooth having a thin platinum tube occupying the center of its long axis.

Pinless. Having holes and grooves in which vulcanite is attached.

Plate. Having long pins and flat back for solder work.

Facing. Same as *plate,* only thinner.

Saddle-back. Having a concave cervico-lingual portion.

Gum. Having a gum-colored portion attached.

Plain. Without gum portion.

Cross-pin. Having pins at right angles to the long axis of the tooth.

Straight-pin. Having pins parallel with the long axis of the tooth.

Slot-and-bar. A removable tooth with a slot in it to slip over a bar.

Bar-and-slot. Having a bar attached to the tooth to slip into a slotted backing.

Short-bite. Having the shoulder and pins near the incisive edge.

Long-bite. Having the shoulder and pins near the middle of the tooth.

Vulcanite. Having short, headed pins.

Vacuum chamber. A space entirely devoid of matter; applied to the depression in a denture calculated to assist in retaining it in place.

Velum rubber. Rubber with about one-fifth of its weight of sulfur. Suitable for making artificial palates. Remains pliable after vulcanization.

Velum vulcanite. Velum rubber after vulcanization.

Vulcanite flask. A sectional metal box for holding an artificial denture while being vulcanized.

Vulcanite. [St., G.] Rubber or caoutchouc that has been compounded with sulfur and subjected to heat.

Vulcanization. [St.] The method of converting rubber into vulcanite.

Wax. [St., G.] Wax is extensively used in the dental laboratory. Pure beeswax, for impressions and articulating models. Wax and paraffin, or earthwax, for trial base-plates, articulating models, etc.

Hard wax, for securely cementing parts in crown and bridge work.

Adhesive wax, which is less brittle and more adhesive than hard wax, is sometimes desired.

Dr. Goslee, "Principles and Practice of Crowning Teeth," gives the following formulæ:

Hard wax. Resin 2 to 4 parts, wax 1 part. *Adhesive wax.* White beeswax 8 oz., pulverized white resin 1½ oz., gum dammar 1½ oz. Melt materials in the order named.

Weld. [St.] To unite or consolidate; as weld to gold in filling. Used synonymously with "autogenous soldering" and "sweating." It should not be so used, as force is the first requisite in welding, and force is not used in autogenous soldering or sweating.

Zylonite. [St., G.] (Same as *Celluloid.*)

Discussion.

Dr. S. H. Guilford, Philadelphia, Pa. I think this organization is to be congratulated on having secured a paper such as the one we have just listened to. I feel sure that it will be considered one of the best papers presented at this meeting. I do not know of anyone better fitted to write upon this subject than Dr. Wilson. As many of you know, Dr. Wilson is not only a student, a teacher and writer, but he is also a worker. I take a very deep interest in this subject and have for many years, and the reason why I do so is because I love my profession and want to see it rise to a higher plane. That can be done in various ways, and certainly this is one of them. We are very fond of speaking of the advancements made in dentistry, and of calling it an art and a science. Now, it is true that dentistry has developed to a great extent, but we cannot claim that it is really a science unless it meet all the requirements of a science. For one thing, those who write or speak on dental subjects should use scientific terms. If you look you will find that throughout the realm of science, in a great majority of cases, and particularly in the more modern sciences, the words and scientific terms used convey a definite idea. That is scientific; it is exact. We have had a gradual evolution in the matter of nomenclature, and we find that in medical science, as well as in our own profession, we have been gradually eliminating those terms which include the names of persons. We have been striking out here and there the name of the individual, and giving to a part the word that indicates what it is.

We used to speak of Riggs' disease, but now it is "pyorrhea alveolaris," which is not a good term for that disease, although it expresses the idea in a way that all understand. We formerly said antrum of Highmore, but now it is the maxillary sinus, a term that expresses exactly the idea of a sinus situated in the maxillary bones. We want to continue advancing in this direction and must therefore eliminate the terms that do not express an idea accurately, and when we coin new terms they should be distinctly definite. The English language is limited in its capacities and resources, and so we are often obliged to borrow from other languages; while on the other hand, other languages return the compliment. The science of electricity has taken nearly all of its terms from the Greek language, and in dentistry we have borrowed many words from both Latin and Greek.

In the matter of improving our nomenclature we have been doing something, but we are moving very slowly. Dr. G. V. Black presented a very valuable paper on this subject before the Columbian

Dental Congress in 1893, and afterward committees were appointed by the National Dental Association, in the years 1895–96, to study the subject. Nomenclature was included in one of the sections of the Fourth International Dental Congress, and now we have the subject included in one of the sections of this organization, so that every year something is presented in connection with it. The Institute of Dental Pedagogics, composed entirely of teachers, has taken up the subject, and last winter at the meeting held in New York, a commission was appointed with authority to appoint subcommittees to select proper men that would carry on the work in a systematic way. If the members of the commission can agree upon a definite system of nomenclature, the schools, journals, and writers will adopt it, and in that way it will be spread throughout the realm of dentistry.

It is very unfortunate that we should have to employ so many words that are inaccurately applied. It has annoyed me for many years that dental dealers should speak of tweezers as pliers. The reason given by them for so doing is that the profession has called them pliers, and so they continue to use the term. We are to blame, to a great extent, because we continue to use these terms that we know are incorrect, for we should adopt the proper words in speaking of instruments and in everything, and I hope that eventually many of these incorrect terms will be eliminated.

In the matter of absorption, Dr. Wilson draws a line of distinction between absorption and resorption, and his definition is correct in at least one particular. He says resorption is the removal of waste products, but the alveolus is not a waste product; it is removed because nature has no further use for it; its space is more desirable than its company.

We have a method of soldering which some call "autogenous soldering," while others call it sweating. It is not welding, as Dr. Wilson says, because there is no force used in the process, and he prefers the term sweating. Neither sweating nor autogenous soldering express the idea exactly, but I think the latter term is to be preferred. He also objects to the name cap crown when used instead of shell crown. I think shell crown is to be preferred in that case. In regard to the word karat, we find that he prefers spelling it with c, and quotes many authorities who prefer the c to the k. He also gives it spelled with k as a second choice, but I think we should drop that entirely and use only the c, because so many of the authorities prefer it.

With reference to the word *carborundum,* I was very much surprised to find that it is not to be found in Gould's dictionary.

Over the terms "cast" and "model" I have struggled for many years. Dr. Grant Molyneaux tried to convert me to the views Dr. Wilson holds with regard to the significance of the two terms, but while he did not succeed then, I think Dr. Wilson has converted me now. I believe cast should be used in reference to vulcanite work, and model when a thing is to be reproduced in metal. It seems a good distinction to make in the use of these terms.

Speaking of the "collar crown," he suggests that term as an improvement upon the Richmond. It has always been a question as to whether Richmond should have the credit for that crown, and I think the preponderance of evidence is that he did not originate it, and I believe collar crown is to be preferred,

because it embraces all the features of that crown. Under the head of crowns, he says that there are two kinds, one attached to the root by means of fixed dowels, and the other by means of detached dowels. There is another class of crowns requiring no dowels at all. We often insert them on anterior teeth that are greatly worn down.

I do not think we ought to change the spelling of words arbitrarily, but the word gauge, in my opinion, should be spelled gage.

In regard to impression cup and tray, we have been in the habit of using the term impression cup, but, as Dr. Wilson says, cup conveys the idea of capacity, while tray implies that which holds and carries; therefore we should say impression tray rather than impression cup.

As to the lingual surface of the teeth, the essayist says that the term palatine should not be used, but prefers lingual, because the inner surfaces of the teeth of both upper and lower dentures are next to the tongue.

We formerly spoke of the superior and inferior teeth, but the terms are not distinctive enough. Superior and inferior refer to quality as much as to position, so we should adopt the terms upper and lower instead. Upper and lower possibly do not sound as elegant, but they are quite proper. The medical profession use superior and inferior, and we copied their words.

I like Dr. Wilson's criticism of the word prosthodontia, that was introduced some years ago by one of our dental editors. It was suggested that as orthodontia was a good word for the correcting of deformities of the mouth and face, prosthodontia would be a good word for prosthetic dentistry, but when we consider the Greek roots from which the word is derived, it will be seen that it is not a correct word. It does not fully express the idea, and while it seems to be in line with orthodontia, it does not express as much as do the terms prosthesis, or prosthetic dentistry.

In regard to another point: When we make a bridge we usually have two abutments or piers, and between these piers we place crowns that we call dummies. That term has come into use because they were so called in the early days for lack of a better word. As yet we have no better word to express that idea, and Dr. Wilson suggests the word *substitute.* That is not good, because it is not sufficiently definite. I do not think that we should abandon the old word until we find one that expresses the idea accurately. The great point in nomenclature is to adopt words having definite and explicit meaning.

Dr. J. H. Crossland, Montgomery, Ala. I wish to add only a few words. I notice that the essayist prefers the use of the word absorption as applied to the taking up of nourishment, and resorption to the taking up of waste products, etc. There is a good reason for this distinction. If we go still deeper than he has gone into the study of the etymology of these words, we find that the word absorb comes from *ab,* away, and *sorbere,* to suck, which in its strict sense means to take up or away. Resorb rather means to suck up again, that is, to take back something. The word becomes more forceful and I think the distinction decidedly correct and happily made.

Truly, the student of etymology finds that the dead languages do not change, but our knowledge of subjects changes. I have thought of two or three words during the course of the discussion that

come under this head. For instance, the word *electron,* which means amber. In olden times the Greeks knew that if they rubbed amber the friction would produce a force which would attract particles of other substances, and the evolution of nomenclature has brought us the term electricity, which conveys no suggestion of amber save to the student of etymology.

If we go outside of the technical terms we find the same condition of things. For instance, the word dilapidated comes from *di,* apart, and *lapis,* a stone. In its original significance it meant a condition of a structure built of stone in which the stones were falling apart, hence could not properly be applied to any but a stone structure; but now time and custom have changed that, and we may correctly say that a wooden building is in a state of dilapidation. I mention these instances simply to show that nomenclature is frequently a compromise. We cannot always find words to express the exact meaning we intend to convey, because in a great many cases we do not understand the subject thoroughly. We may express what a subject means now, and next year it may mean something else.

I am in favor of classical derivatives in all cases where they can be reasonably retained or introduced. They add to the strength and dignity of language; conduce to order in science; illuminate the path of research, and inspire the student to basic culture. I do not think it well to change a word unless there is a very good reason therefor.

With regard to the derivation of karat, there is another derivation that the essayist might have mentioned. Way back in early Egyptian times *karat* meant a grain of wheat which was used in weighing precious metals, etc., and they spelled it with a k or a similar letter, and that is the reason we use k instead of c.

With regard to the term pyorrhea alveolaris, just as Dr. Guilford says, it does not express the whole idea, but it probably comes as near to it as any descriptive derivative—if I may use such a term. But sentiment, and only sentiment, would entitle Dr. Riggs' memory to perpetuation in connection with it.

Dr. James McManus, Hartford, Conn. In discussing the subject Dr. Guilford speaks of Dr. G. V. Black as one of the first who wrote on this subject. I think we can go farther back still—to the writings of Drs. Atkinson and Corydon Palmer. It has been a matter of surprise to me that my friend Dr. Guilford, in the many years that he has been interested in this subject, has not taken a more active stand in forcing his scientific ideas on the profession through the medium of the association. If he wished to do here what should have been done in the National Association of Dental Faculties, he would insist upon a committee being appointed, consisting of representatives from each college, for the purpose of devising a system of dental nomenclature, to be published in book form under the auspices of the association, and later on adopted by teachers. These little books on nomenclature could be given to each student, who would be guided thereby in his selection of terms. I am glad to hear Dr. Guilford say that there has been some little move made in this direction, but it is likely that it will be as slow as it has been in the years past, unless we work systematically and earnestly, and the only practical way that I can see is to have these little pamphlets or books published. After they have been in use for one or two years, the publishers

of dictionaries will be glad to incorporate their contents in their new editions. If we can secure proper support it will take but a short time to select the proper terms and to place them in the hands of the students.

Dr. GUILFORD. That is what I have done. At the last meeting of the Institute of Dental Pedagogics, which is composed entirely of teachers, there was a paper presented on the subject we have been discussing. The suggestion was made and adopted to select the proper men to go over one or two subjects each year, and to refer their report to a committee to criticize and improve it if possible. The report with correction would then be presented to the association, which after passing on the report finally, would send a list of accepted words to the journals and colleges. The next year two, three, or more subjects would be taken up, and so on, until all the subjects of dentistry would be covered.

The next order of business was the reading of a paper by Dr. J. H. CROSSLAND, Montgomery, Ala., on "Prophylaxis a Factor in Dental Education," as follows:

Prophylaxis a Factor in Dental Education.

By J. H. CROSSLAND.

WEBSTER'S International Dictionary defines prophylaxis as "the art of preserving from or preventing disease," etc.

The exponents of what some see fit to denominate "the new departure," with seemingly perfect unanimity, recognize the necessity of frequency and periodicity in the application of this art to the treatment of the human mouth. In the client who returns with punctilious periodicity for examination and advice, and such services as may be necessary, and who is intelligent and tireless in his efforts to obey instructions, we find one extreme; at the other is the patient who comes to us only to seek relief from pain. Probably no practice is without these extremes or any of the degrees between them. At the latter extreme, and the degrees between it and the first mentioned, we have a class of *clientèle* whose enlightenment is one of the great problems of the dental education of the period. "Doctor" in its primal significance meant teacher, but it does not now bear that significance. This applies, especially, but not exclusively, to the lay mind.

Daniel Webster believed that inspiration or preparation was absolutely essential to a consummate utterance. Indeed the solution of the aforesaid problem will require both preparation and inspiration—inspiration on the part of the patient, and preparation and inspiration on the part of the practitioner. The heart of the teacher must throb in unison with the import of the words he utters and the lessons he would teach. The most eloquent words the human tongue may speak are useless if the soul of the speaker is not attuned to the spirit of his theme.

Mechanical, surgical, and therapeutic procedures in their varied forms and many aspects have brought degrees of relief from those ills with which civiliza-

tion and lack of function have afflicted the oral cavity.

Our art has struggled forward, buoyed and led by untiring genius, its meandering course bringing it at times within the rays of that great beacon of human progress—the light of science. And thus has its partial attainment of its destiny as a specialty in the great economy of human effort brought to the zealous and worthy of its votaries that *sine qua non* of all human advancement —inspiration to further progress and higher attainment. Perfect consummation of even our dominant theories and hypotheses of former years could have resulted in only an approach to such conditions as nature designed. But the object of the prophylactic treatment of today is far above and beyond this—the maintenance of natural conditions—and the ideal of today, in the eternal fitness of things, is higher and grander than any other period of our development has ever known.

A woman's neglected mouth—an accumulation of calculi and débris in wild profusion, teeth opaque and lusterless, gums all bleeding and sore—a foul, filthy, repulsive, and dangerous mouth—an approach to a disease, loathsome, horrible, maybe incurable—prince of oral diseases; cheeks sunken and innocent of color, eyes lusterless, languid, and wan; and through this mouth passes nourishment for this mother and her child!

A few months of the application of prophylactic treatment with unflagging energy, punctilious periodicity, and strict obedience to instructions, and behold the changing picture! Gums are coral now, and the stiffest bristles redden not upon them more. To the teeth the mingled gleam of ivory and luster of pearl is returning, and translucency in its vital glow and splendor; back to the rounding cheek the rose tint is creeping, and the fire of life and aim again is kindling in the twinkling eye. A troop of young hopefuls are filling appointments with a punctuality which betrays maternal inspiration. Verily, the heart that throbs not with professional pride in the presence of such a picture must be immune alike to the beauties of esthetics and the grandeur and glory of the high and holy spirit of ethics!

The proceedings of our meetings and the pages of our journals teem with theories and hypotheses as to means of enlightening the masses regarding the necessity of dental services and advice; and pages and pages of logic and eloquence have been expended on this topic with seemingly no adequate results.

In the so-called "new departure" which is constructively such, a most splendid opportunity is presented for the dissemination of such enlightenment. Were schoolboys taught one day of every month, and allowed to devote all the other days to play, how much of their curricula would they assimilate? How much of our instruction does the average patient assimilate sufficiently consummately for guidance during the long, perhaps yearly, intervals between visits to us? How different is this assimilation by those clients who make monthly visits for hygienic care? Read the answer where minute stoppings forestall caries' ravaging blight; where, in prodigal profusion of curved lines, coral gums embrace, in matchless symmetry, graceful forms of dainty ivory, and immaculate surfaces of gleaming pearls charm the vision of those whose souls are congenial with the good, the true, and the beautiful! There is an inexpressible sense of cleanness which delights the re-

fined, and the cultured client enthuses over the lustrous vitality, comprehending the significance of periodic supplementation of function effected in accordance with the mandates of that mysterious force which imparts rhythm to the movements of the universe.

In short, and in conclusion, constant observation of pathological conditions, and systematic and inspired effort to reach the ideal—the physiological—will, in the natural course of things, furnish incentive to deeper and more thorough study and research into these important and basic subjects. The closer relation and better understanding between practitioner and client, which will come to them, will redound to the great good of the latter and to dentistry, as well as to the worthy practitioner. The public is gradually, if slowly, coming to realize that a dentist should be something more than a mere mechanic; that, forsooth, intelligence, culture, and refinement are necessary to his symmetrical professionalism. This has been learned by some even from the irregular contact with him which has so long and so generally prevailed. The frequent and regular intercourse between him and his client is replete with opportunities for the observation of the degree in which he has attained to these requisites; and its effect as to the enlightenment of the lay mind is destined to become a mighty factor through that beautiful law of compensation which finds expression in the survival of the fittest.

The chairman announced as the next order of business the reading of a paper by Dr. H. Herbert Johnson, Macon, Ga., entitled "A Review of the Methods Employed for the Retention of Fillings," as follows:

A Review of the Methods Employed for the Retention of Fillings.

By H. HERBERT JOHNSON.

Before proceeding with the main subject under consideration, I wish to explain that while the subject-matter of the paper will of course deal largely with contour gold filling, yet I would very much dislike to have it construed for a minute that I advocate, even to a small extent, a useless display of gold in teeth. On the contrary, I look upon it as most reprehensible, and advocate and practice the filling of all incipient cavities of decay from the palatal and lingual surfaces where possible. With my efforts constantly directed to the accomplishment of this purpose—endeavors extending over a long period of practice—I have found that it is possible in over fifty per cent. of the cavities occurring in the six anterior teeth. It is hardly necessary to further state, except in defense of my proclivities for progressiveness, that I am not unacquainted with porcelain work and all methods of burnished gold work, as cast fillings, hoods, staple crowns, etc.

I fully recognize that all of the newer methods alluded to must be practiced by everyone who would render the best service possible to his *clientèle,* as we have

not yet reached a point where we will not occasionally find a use for contour gold filling, even though we recognize and regret the objectionable display of gold.

It is my belief and I think I can show conclusively, that the methods of preparing cavities for the reception of the filling material, not only in these display fillings but in many of the other class, have in the past been attended with a needless destruction of strong sound tooth tissue, which could not only have been avoided, but by the employment of other systems greater strength of retention could have been obtained. To make my argument, if possible, more convincing, I wish to submit for your consideration a partial review of methods of retention as advocated and practiced by some of the leading operators and writers of modern times.

During and since the days of Marshall Webb, the best operators and writers—including Webb—have almost unanimously advocated for the retention of gold contour fillings, especially in incisors, either cutting a step taking in one-half or two-thirds of what is left of the incisal edge of the tooth (see Figs. 1, 2, and 3), or cutting what is usually termed a doll-head or arm on the palatal side, near to the cutting edge, extending quite two-thirds across the tooth, involving all of the enamel plate and nearly the entire thickness of dentin. (Figs. 4, 5, and 6.) Even the advocates of these procedures have admitted the weakened condition resulting from the cutting of the dovetail or doll-head on the one hand and

Fig. 1.

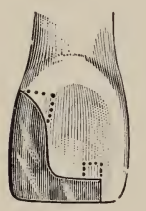


Fig. 2.

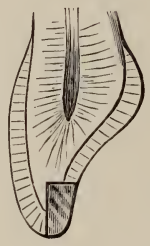


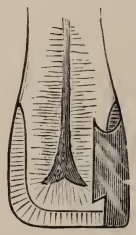
Fig. 3.

Fig. 4.

Fig. 5.

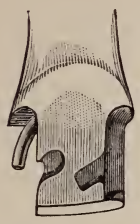
Fig. 6.

Fig. 7.



the increased display of gold from the cutting of the step on the other.

Fig. 8.



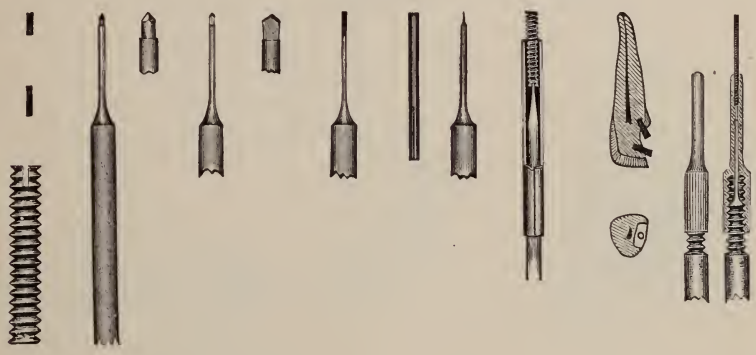
Dr. C. N. Johnson, in a series of very ably written articles running through volume xl of the *Cosmos,* presents on page 813 (figures "10" and "12") illustrations of a method which he advances for the retention of these large fillings. Of course by this method he prevents, for the time being, the extra display of gold which would be occasioned by the step-cutting (see Fig. 3), and anticipating the crumbling, removes entirely the weakened lingual wall of enamel that is left in the cutting of a doll-head retainer. (See Fig. 5.) But it is very plain to even a casual observer that he has left a very weak, partially unsupported wall of enamel on the labio-incisal edge of the tooth.

In the "American Text-Book of Operative Dentistry," edited by Dr. E. C. Kirk, we find on page 192, in a strong article by Dr. S. H. Guilford on "Cavity Preparation," the illustration as seen in Fig. 4, where he extends an arm on the lingual surface, which he recommends to be cut but little deeper than the enamel. The weak support this method gives to the filling can readily be observed by the practical operator.

Dr. M. L. Hanaford, in an article before the Illinois State Dental Society on the "Preparation of Cavities," published in the *Dental Review,* vol. xii, page 681, says, "The third type of cases includes those cavities in which caries has progressed so far toward the incisive edge as to render unsafe any undercutting for retention at this point, but where, for esthetic reasons, it is desirable to retain the labial plate of enamel. In such a case the lingual plate is removed for a sufficient distance from the incisive edge root-wise, and extending into the body of the tooth far enough to make possible a step. This is deepened at the extremity, squared, and made retentive." (See Figs. 1 and 2.) This suggestion of Dr. Hanaford is clearly after the method of Dr. Johnson, as can readily be seen by comparing the two systems.

In this connection I would also refer to the idea advanced by Dr. Weld of New

Fig. 9.



York, published in a leading text-book. This method is illustrated in Fig. 3, compared with that advocated by Henry Sewell, M.R.C.S., L.D.S., of England. (See Fig. 7.) Dr. Sewell's method

Fig. 10.

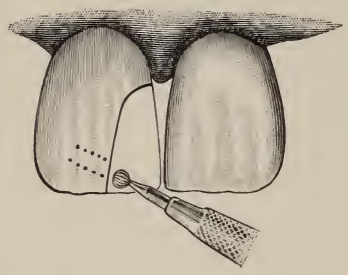
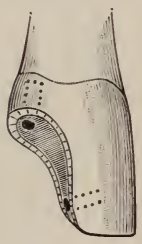


Fig. 11.



would have the advantage from an esthetic point of view, but would be at a disadvantage as to strength of retention.

In *Items of Interest,* vol. xxvi, page 130, appears an article by Dr. Hanning, read before the Second District Dental Society of the State of New York, in which he advocates a kind of post retention for these display fillings. This idea, however, seems to be limited to those devitalized teeth where use can be made of the pulp-chamber and pulp-canals. (See right side of Fig. 8.)

I feel that it is hardly necessary to go farther into a review of such methods, as I believe these few will suffice to establish the fact that they constitute the prevailing methods of retention of this class of fillings, if indeed, there be anyone who would be prepared to deny it at all. I also believe that all will admit that in these methods there is necessarily a great sacrifice of sound tooth tissue, and in some instances a great display of filling from excessive cutting.

The only other means heretofore brought forward to improve these destructive methods—at least the only one which has come to my knowledge—is the little anchor screws sold by The S. S. White Dental Mfg. Co. and illustrated in Fig. 9. These screws have been used to a limited extent in very favorable cases, but they have never been popular on account of the clumsy size, and the difficulty in securing the accuracy necessary for their adjustment, as they depend on the holding power of the threads in the dentin for support. They also require a hole

Fig. 12.

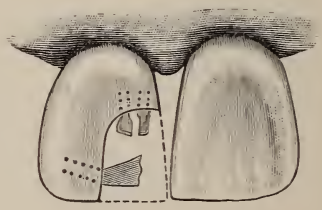
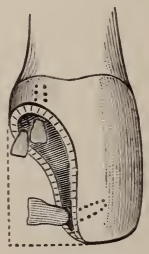


Fig. 13.



to be drilled, the size of which weakens the body of the tooth very materially.

As a general substitute for all these methods of preparation of cavities and retention of filling, and especially those

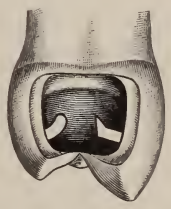
contour fillings involving the restoration of the corners of incisors, I wish to offer the following idea, which if not new, at least possesses some novelty, and which has not thus far, to my knowledge, been illustrated or published; it has in its favor the essential points of being extremely simple, strong, and practical: Instead of cutting away so much strong enamel and dentin in the formation of the steps for anchorage, it is only necessary to remove all weak walls, clear out the decay, and polish the margins of the enamel. Next make a slight groove, undercut, or any other shaping desired, at the approximo-gingival margin of the cavity, from which to begin the filling. At the incisal edge take a very small round bur—about No. ½ of the "revelation" type, and bore a hole into the dentin between the two plates of enamel. Begin at the extreme incisal edge of the cavity, and proceed downward and backward approximately at an angle of about forty-five degrees, just missing the posterior horn of the pulp. (See Figs. 10 and 11.) Extend this hole deep enough, using judgment in each case, to give firm anchorage for the little iridio-platinum retainer which is to be cemented into it. (Figs. 12 and 13.) These little stays are preferably made of squared iridio-platinum wire, No. 20 gage or smaller, according to the size and thickness of the body of the tooth.

To give them an increased holding power, they are barbed on the edges, bent at an angle, and flattened at the end that is to be embedded into the body of the filling. Being thus flattened—which is quickly and neatly done by crushing with a pair of strong pliers—it will be readily observed by studying Fig. 13 that the bulk of the metal of the stay is all there for strength, and yet the flattening process has given it such shape that the strength of the gold has been but little impaired by having it thus flatwise embedded into it. The little wire stay can be easily adjusted, even in narrow spaces, by taking care to carry it to place with the flattened end projecting either labially or lingually, until it is pushed clear up into the previously drilled hole, and then turned downward until it assumes its correct position, as is seen in Fig. 12. These little wire retainers are exceedingly strong, and will stand an enormous amount of force. By their use we sacrifice a minimum amount of valuable tooth tissue, reduce the display of gold to the smallest possible, and also get a much stronger anchorage for the filling. They are applicable to many other classes of cavities, as will be readily suggested to the practical mind. The simplicity of

Fig. 14.

Fig. 15.

Fig. 16.



making and adjusting appeals at once to the progressive reasoner.

In Fig. 15 the application of the gold is shown, half built in, about the retaining wires seen in Fig. 14.

A suggested application is further shown in Fig. 16 which might extend the field of usefulness of these stays beyond that already demonstrated.

Dr. N. C. Leonard, Nashville, Tenn., then read a paper entitled, "'Pressure Anesthesia' and the Removal of Living Pulps," as follows:

"Pressure Anesthesia" and the Removal of Living Pulps.

By N. C. LEONARD.

No development in dental science during the past twenty years deserves a more prominent place in the esteem of our profession or a more conspicuous place in its literature than the procedure known as "pulp extirpation under pressure anesthesia," for perhaps no other method introduced during recent years has been of more real value to the intelligent operator, or of more comfort and benefit to his patients.

At the time of its introduction, more than ten years ago, dentistry must have felt the need for a more satisfactory and scientific method of pulp-removal; yet its slow adoption and the half-hearted manner in which it is employed today would still indicate an uncertain or distrustful attitude, wholly inconsistent with progressiveness in modern surgical procedures.

The use of devitalizing agents had for many years proved a more or less satisfactory treatment in cases demanding pulp-removal; and the ease of such applications must have exaggerated the seeming difficulties of the new method, without suggesting its advantages to the operator who is content to follow the course of least resistance, and drift with the tide. But without going very deep into speculation as to reasons for the lukewarm reception to so valuable and scientific a method, I will broadly charge the delay to those faithful adherents who have failed to supply dental literature with suitable testimonials, and will proceed with an endeavor to meet my own delinquency.

With the hope of adding a little more weight to the arguments I shall use in my discussion of the subject, I will begin by stating that for the past ten years I have used this method exclusively in my practice, treating, certainly, more than a thousand cases without, to my knowledge, having had a single case to end in abscess or pericemental infection. A very few cases of partial failure could be readily traced to faulty manipulation, and they only serve to improve my technique and increase my faith. Such a clinical result as this could hardly be accidental, nor could the success be due to the selection of favorable cases, since this report includes all cases which demanded pulp-removal as they presented—with a very few exceptions which I shall mention later—and embraces a very large percentage of cases where the exposures were most difficult of access, and in patients of all ages and variety of temperament.

Theoretically the method seems to approach perfection; clinically its possibilities should only be limited by the intelligence with which it is applied and the dexterity of the operator.

In the light of modern surgery it must be admitted that in a surgical operation where living tissue is involved, the only assurance of ideal results is a clean field of operation and sterile instruments, followed by a non-irritating and antiseptic dressing.

With the aid of pressure anesthesia the removal of the living tooth-pulp becomes a simple surgical procedure, to which all the principles of modern surgery apply; and it must be admitted, again, that an ideal result must be obtained where a live tooth-pulp is aseptically excised at the apical end of the root, and the removal is followed by an antiseptic dressing to the remaining stump, and complete filling of the root-canals.

The only question that admits of argument is whether or not this can be accomplished in a sufficiently large percentage of cases to justify us in adopting it as a routine method of treatment in all cases demanding pulp-removal.

My own clinical experience is to me the best argument; and while I do not claim, nor believe, that in my practice there has not been a very considerable percentage in which the ideal conditions suggested above have not been accomplished, my uniformly successful results would indicate that we may safely allow ourselves some latitude in deviating from the ideal, provided our technique includes a remedy for the imperfections. Certainly, I would not attempt to claim, nor do I believe it possible to accomplish, the excision of the pulp just at the ideal point—the apex of the root—and its removal perfectly in every case; neither do I believe it possible to have always a sterile field through which to operate; so I prefer to treat the subject from a practical standpoint rather than from that of the idealist.

To recite briefly the technique the results of which I have found so satisfactory, will perhaps enable me to better present my reasons for deviating from what would appear to be the accepted teachings of authorities who have written most plausibly on the subject, and whose teachings I believe to be in some important respects unscientific and misleading.

The term pressure anesthesia as used in this paper is not meant to include the operation of forcing an anesthetic agent through the structure of the dentin by means of a special instrument, but only the simple form used for anesthetizing exposed pulps. The method is very simple, and may be easily and successfully used in any cavity where an exposure may occur, from the third molar forward.

After excavating the cavity slightly by breaking down all frail enamel edges, and removing such loosened material as would interfere with an actual exposure of the pulp, the cavity should be thoroughly washed with warm water. If the location of the cavity permit it, the rubber dam should be adjusted, though if the operator be careful this is not essential to success. After cleansing the cavity as suggested, being sure that an actual exposure exists, I usually apply a pellet of cotton saturated with an agent that is both disinfectant and analgesic, allowing it to remain for two or three minutes. For this purpose I prefer to use carbolic acid, on account of its sterilizing and anesthetic effects, and also because it prepares the pulp-membrane, by virtue of the escharotic action of the acid, for more ready entrance of the cocain.

By the use of soft yellow wax, pressed into place with slightly moistened pellets of cotton held in a pair of pliers, the most awkwardly shaped cavity can be made into a very simple one for the application of the cocain—barricading, for instance, the interdental space by building-in the soft wax, and converting a difficult approximal cavity on the distal surface of a molar into a simple funnel-shaped cavity with the pulp-exposure at the apex of the funnel.

I use powdered cocain moistened with enough adrenalin solution to make it into a paste that can easily be transferred on the point of an instrument to the point of exposure, applying, perhaps, on an average, about one-quarter of a grain of cocain. This pasty mixture becomes more fluid upon contact with the pulp, partly by the exudates from the pulp and partly, perhaps, on account of the warmth of the tooth. By allowing this agent to remain in contact with the pulp for one or two minutes, the membrane of the pulp is generally sufficiently anesthetized by osmotic action to render the remaining part of the anesthetizing operation almost entirely painless.

A pellet of wax is then placed in the cavity in such a way as to confine the fluid cocain against the pulp, and at the same time to exclude as nearly as possible any bubbles of air that might displace the fluid. Then by slight pressure on the wax, either with the finger or a pellet of cotton held in the pliers, the pulp is instantly anesthetized, and may be immediately removed.

After removing the wax from the cavity at the point of exposure, I flood the cavity with a good antiseptic, usually one of the essential oils; then with a sterilized bur held in the engine handpiece I extend the cavity, if necessary, to allow for a ready entrance to the root-canals, in order to bur out the bulbous portion of the pulp. After removing the débris, and again flooding the cavity with an antiseptic, I proceed with barbed canal broaches—which have been previously sterilized—to remove the pulp from the root-canals. This is usually, except in single-rooted teeth, the most difficult part of the operation, and being of much importance should be done at the expense of time rather than at that of thoroughness. If the anesthesia be not complete, it may be supplemented at any time by additional applications in the same manner as at first.

If the pulp has been removed from one canal, and in others is found to have partially regained its sensitivity, the first canal should be carefully filled, and then the anesthetic agent be reapplied to the others, until each filament, so far as is practicable, has been removed. Broad, flat canals, or those that are very small or much constricted at the entrance, together with anomalously shaped teeth, often constitute complications that tax our ingenuity and modify our success.

But these are difficulties that must be met with in any method for the removal of the pulp. In the light of my own experience and observation, it is obvious to me that if some of the contents of the canals cannot be removed, it is much safer to render such fragments of pulp tissues sterile at the proper time rather than to have to treat a septic condition later on. Many of the difficulties of extirpation are minimized by experience, but it is safe to say that no operator, however skilful, can in every case remove all the pulp tissue.

However, thorough and complete extirpation is not in itself a guarantee of successful results. As in other surgical

operations, the most important factor is asepsis, and at every step, from beginning to end, aseptic precautions should be observed in pulp-removal.

While I advocate all reasonable aseptic precautions during the operation, I am much inclined to allow my clinical experience to lead me to the belief that the danger of pericemental infection from this operation has been somewhat exaggerated by some writers.

When we speak of an aseptic operation the term is used only relatively, since we know that no surgical operation is absolutely aseptically performed. It is even admitted by the most eminent surgical authorities that no operation is ever free from pyogenic and other inflammatory infections. We know, however, that normal tissue will tolerate a certain amount of infection, and while this fact should not influence us in our efforts to secure asepsis, it will help us in a measure to account for our good results!

The presence of an ulcer on the surface of the pulp should not be a reason for the postponement of the operation of extirpation under pressure anesthesia. The facility with which we are able to apply readily such strong disinfecting agents as carbolic acid, creasote, etc., will enable us to so nearly sterilize the septic area as to make the progress of the operation practically safe.

The surgeon who removes a septic appendix, ligating the base and cauterizing the stump with carbolic acid, gets as good results as the one who carefully everts the stump in order to throw all the originally infected area outside the peritoneal cavity. Certainly the peritoneum is more sensitive to infection than the tissue with which we have to deal.

Admitting that a very small amount of septic matter remains on the surface of the pulp, this would not seem to me to be a serious menace to the pericemental tissues, when we consider that it would have to filter through the entire length of the pulp, and that the tissues liable to infection from this source are to be immediately removed under surgical precautions that would inhibit the further distribution of these toxic agents.

When the pulp has been removed my invariable rule is immediate filling of the canals, and this I consider the greatest safeguard against pericemental infection. If all reasonable aseptic precautions have been observed in removing the pulp, I cannot believe that there could be a more favorable time for filling the canals than immediately after the extirpation, while we have the greatest possible assurance that they are sterile. To delay this part of the operation for a subsequent sitting would be but to double or treble the chances of infection, without offering any compensating advantage, and would deprive us of the use of the best means at our disposal to combat and render innocuous any septic or infectious material that may have been introduced into the canals during the operation.

Certainly no progressive surgeon, after performing an aseptic operation for appendicitis, could be excused for leaving the wound open for subsequent examination to see if everything is all right. He removes the appendix, ligates the stump, manipulates the tissues as little as possible, and closes the wound permanently with an aseptic dressing, which he does not expect to remove until the wound has healed.

The proper filling of the root-canals after the extirpation of the pulp is simply the application of a suitable and permanent surgical dressing for the protection of the living tissue at the end of the

root, and is efficient in proportion as the filling is aseptic, antiseptic, non-irritating, and stable.

As a result of extirpation of the pulp there is often considerable and persistent hemorrhage, and the presence of this condition is urged by our authorities as a positive indication against immediate root-filling. To me, their reasoning appears illogical and their position indefensible. The very best device possible for controlling hemorrhage is mechanical means, and I can see no reasonable objection to the immediate introduction of a permanent root-filling for this purpose. Assuming that the operation so far has been done with due regard to cleanliness and asepsis, there should be nothing to fear if we stop the flow of blood with an antiseptic and non-irritating dressing placed in contact with the bleeding stump.

The blood itself is sterile, and if we observe the same precautions in the preparation and introduction of the filling materials as were observed during the extirpation of the organ, there could certainly be no more reason to fear infection than if the hemorrhage had not occurred. If there be danger from a clot in the apical region, then there would be less danger with the root filled, for the reason that there would be less space for a clot, and the chief avenue of infection would be shut off by the filling.

I cannot conceive of a surgical operation of any kind being completed without leaving a certain amount of free blood to coagulate in the wound; but in the case just mentioned the amount of free blood left would be inconsiderable and insignificant as compared with that left by the most careful operator in an abdominal section, where the wound is immediately closed and permanently sealed with the assurance—in non-septic cases—that if no infectious material has been introduced by the operator, the small clots will not affect his results.

If persistent hemorrhage through the canal after extirpation should deter the operator from performing the immediate-filling operation, the clot that would surely be present at a subsequent sitting would be a much more serious menace to a successful result, in my opinion, than the presence of a coagulum in the first instance. With the root-canals properly filled, the chances of a secondary hemorrhage, against which we have been repeatedly warned, do not seem to me to deserve serious consideration.

As a root-filling material for this class of cases, that which I have adopted—and which seems to meet the requirements—is a paste made by mixing two parts of a coarse cement powder and one part of aristol with oil of cinnamon or any other essential oil or antiseptic agent. This can be introduced with smooth broaches into the bleeding canal, thus partially filling it. Then, with pellets of cotton held in the pliers, the paste may be forced into the canal as the blood is forced out, and packed as hard as may be desired. The cotton pellets, besides forcing the paste into the canals, absorb the blood and excess of fluid from the paste.

If there be any reason to believe that any considerable quantity of free blood has been confined in the apical region beyond the paste, it may be allowed to escape by passing a small, smooth broach through the paste to the end of the canal, subsequently closing the opening with a sterilized gutta-percha canal-point. I use this paste as a permanent dressing in all canals where I have practiced extirpation, generally supplementing it with a

gutta-percha point, and packing the paste with cotton pellets, using always considerable force to make it as dense as possible, and at the same time to force it into all irregularities of the canal.

I do not urge this as the only or the best method of filling root-canals in this class of cases. As it has proved itself satisfactory in my hands, and as it seems to be non-irritating, permanently antiseptic, and is easily adapted to all cases, it may appeal to others.

Among the cases I have treated by this method there have been many in which I was unable to remove all pulp tissue from every canal. From many canals in the buccal roots of upper molars and the mesial root of lower ones, too small to admit of entrance with any ordinary nerve-broach or so constricted as to admit the broach to only one-third or one-half their length, I have found it impossible to remove all the contents. In these cases, if I cannot remove the pulp, I always leave it in. This is at least the philosophic thing to do, and I do not worry over any possible failure. I do not in such cases hesitate to introduce immediately a permanent filling.

After filling the other canals in the usual way, I flood the whole cavity with the antiseptic that was used in making the paste for the root-dressing, working it with the smallest nerve broach as far in beyond the remaining stump as possible, then applying the paste directly against the bleeding stump, and with pellets of cotton held in the pliers, packing the paste firmly, using a considerable amount of force, in the hope, at least, of injecting the canal or the pulp-filament with the antiseptic.

This will no doubt be criticized as being unscientific. Perhaps it is. I should like, myself, to have a method more in accord with accepted scientific theory. I shall not attempt to defend it as scientific, but will report only my results. So far as I know, I have never had a case of this kind to end in abscess formation. A small percentage have manifested slight temporary soreness, but the percentage has not been larger than in cases where I had reason to believe all the pulp tissue had been removed. A striking fact is that none have shown neuralgic symptoms. In the majority of cases where slight tenderness or soreness has been present, I have generally attributed this symptom to traumatism, sometimes to mechanical irritation of the root-filling, or to incorporated air. But very few of the cases have had recurrence of this symptom.

My success with the method I have attempted to discuss I do not attribute to any unusual degree of skill on my part, but to the correctness of the principles on which the method is founded—true surgical principles.

The knowledge that many of my operations have been very imperfectly done without seriously affecting the results has added largely to my faith that it is the true method, and that it will ultimately prevail against the use of devitalizing agents. As stated before, I have found it applicable to nearly all cases requiring the removal of living pulps. The cases of which I have made exceptions would not amount to more than two per cent., and include but two or three cases in which the pulp tissue seemed to possess an idiosyncrasy against cocain anesthesia, and even in these I have suspected some faulty manipulation in applying the anesthetic.

In another small percentage of negative results I have found the cause to have been a partially devitalized condi-

tion of the pulp, the dead portion barricading the way by its valve-like action, and preventing the ingress of the anesthetic.

These, with a few cases of timid patients, constitute all those in which I have been unable to utilize the method under discussion.

Pulp-stones have often been difficult complications, but I do not now remember a case of this kind in which I have been forced to resort to a devitalizing agent.

Discussion.

Dr. W. H. Leak, Watertown, N. Y. The paper we have just heard shows the care the essayist has used in its preparation, and the thoroughness with which he performs the operations he has described, a factor which in a great measure accounts for the success he has had in such a large number of cases. He alludes to the very small percentage of cases in which he has not been able to obtain anesthesia by the pressure method, owing to the presence of a slightly disorganized pulp, and I note that in such cases he uses carbolic acid prior to the application of cocain. I am unable to understand why he uses carbolic acid, which we know is a strong coagulant that would render the pulp more difficult to anesthetize.

With regard to the thought that he brought out in connection with the filling of the root-canals after extirpation of the pulp: I have wondered if I misunderstood him in thinking that he said that he filled the canals even in the presence of a slight blood exudate, and that no trouble ensued, either in the form of an abscess or of pericemental infection. It seems to me that it would be best to wait until the flow of blood has ceased before filling the canals.

I had one peculiar case in connection with the extirpation of pulps with cocain that I would like to relate, and to ask whether any others have had a similar experience. It was the case of a strong, healthy woman, about forty years of age, in whom I used a solution of cocain and adrenalin. After pressure on the pulp had been exerted for a minute or a minute and a half, the patient raised her hand in an endeavor to stop the operation, and I removed the rubber dam after inserting a small pellet of cotton into the cavity. The patient then told me that she was feeling very faint, and complained of an oppressive burning sensation that lasted for a few minutes, after which she recovered completely.

Dr. J. H. Crossland, Montgomery, Ala. I am not opposing any of the views expressed by the essayist, but if there is anything which has been impressed upon me by considerable clinical experience, it is that there should be a period of rest and drainage after the extirpation of the pulp, before the canals are filled. If they be filled immediately after extirpation there is a greatly increased danger of discoloration of the tooth. We may easily talk of the scientific methods of removing the contents of the tubuli, but when we fill these teeth immediately a large percentage of them will discolor and break down, and the red blood corpuscle will get in its work.

In regard to the application of cocain in powder form: There is a preparation put up by Schieffelin & Co., in pellets, which is very convenient and satisfactory to use in these cases. After the pulp is exposed and the cavity dried, a piece of the pellet is placed in contact with the pulp, and when the cocain has become

moist by the exudation from the tissues, pressure is applied, and anesthesia usually results.

I did not understand the essayist's remarks with regard to mummification. I thought that it was a thing of the past; that progressive dentists did not attempt to mummify a pulp, except in cases where it was found impossible to remove it entirely.

Dr. CHARLES MCMANUS. I would like to offer a suggestion as to the first two words in the title of the paper, and that is the expression "pressure anesthesia." We have just had a paper on nomenclature, and it occurs to me that pressure anesthesia is not a good name for that procedure, although it is the term in general use. I do not know that I can present a better one, but it seems to me that there should be some exact term applied to the very important operation of cocain pressure anesthesia.

I have enjoyed hearing this very instructive paper by Dr. Leonard, and am particularly pleased with the way in which he has presented the subject. The results he has obtained are most satisfactory and encouraging, and the essay itself is a model, as a short, clean-cut, scientific paper.

Dr. W. D. MONROE, Washington, D. C. I think if the essayist will use adrenalin in connection with the cocain, such as the Parke-Davis tablets, it will do away with hemorrhage in nearly every case. It can be obtained in tablet form from any druggist, and is very convenient to use.

Dr. LEONARD (closing the discussion). I would like to thank those who have taken part in the discussion for the interest manifested in the subject, and for the compliments paid my paper. I trust that I have shown what I endeavored to show —a scientific spirit in the investigation of this subject. I tried not to be dogmatic in any of the statements made, and I certainly hold myself ready to receive any suggestion that may be an improvement on the technique that I have suggested, or in the treatment of these cases.

I will just refer to some of the points mentioned by those who have discussed the subject. Dr. Leak spoke of the use of carbolic acid previous to the application of the cocain. My reason for it is threefold: In the first place, carbolic acid being a powerful sterilizing agent will, to a degree, destroy any septic matter that may be present at the exposure. Sometimes there is a little pus present, and by such means I endeavor to destroy any material that may be the cause of it. I also use it on account of its analgesic and anesthetic effects, as I think that the carbolic acid renders more favorable the entrance of the cocain into the tissues, and while I do not wish to make a positive statement about this point, yet I feel that in many cases the anesthesia is produced more quickly where carbolic acid is used than where it is not, and that perhaps the coagulum formed on the pulp tissue is more favorable to the osmotic action that carries the cocain into the pulp.

The case reported by Dr. Leak I consider a coincidence; the same symptoms would probably have been noticed had no toxic agent been used at all. I frequently have had cases in which although no agent whatever had been employed, symptoms occurred that I would probably have attributed to cocain if I had used it. I have very seldom seen any constitutional effects following the use of cocain by the method I have described. I can recall but one case where I was sure at the time the cocain had caused the toxic effects, and I suspected then that

some of the fluid had leaked through, and been swallowed by the patient.

As to drainage I can say that it is not necessary, if we have been careful in our antiseptic measures during the removal of the pulp. If we have been careful we will have as nearly as possible a sterile field. Why not apply a surgical dressing, just as the surgeon does in the case of major operations? After he operates he places a dressing to protect the tissues that have been wounded, and leaves it in place expecting that it will keep the tissues aseptic until the wound has entirely healed. It is simply a surgical procedure, and I think we are thoroughly warranted in using the same methods in dental surgery, where we have reason to believe that the operations have been done aseptically, as are used in surgical major operations. As far as drainage is concerned we get better results without drainage, by lessening the chances of infection, as surgeons do in abdominal operations performed under aseptic precautions.

As to mummifying: I did not use the term mummifying at all, because I did not want to be regarded as an advocate of mummifying pastes, etc. The only reference I have made to this paste is where I have used it as a dressing simply, in cases where I could not remove the pulp tissue, where the canals were too small or tortuous, or where there was some physical reason why the pulp tissue could not be removed. In no cases do I leave the pulp tissue in the root-canals, except when it is absolutely impossible to remove it. But in those cases where I have used this paste as a dressing to remaining stumps that I have been unable to remove, my results have been satisfactory, for at least I have never had to contend with abscesses, or other serious after-results.

I agree with Dr. McManus that pressure anesthesia is not a suitable term to designate these operations. I used the term in quotation marks, simply to indicate that this was the operation known as pressure anesthesia, and I said that the term as used in the paper was not meant to include the procedure in which special instruments were required to force the agent into the structure of the tooth.

As to the use of adrenalin, perhaps Dr. Monroe did not notice that I said in my paper that I used adrenalin in connection with cocain. I do not know that it offers any special advantage, unless it be that the anesthesia is thereby more easily induced. I began the use of adrenalin in hope that it would inhibit hemorrhage, but so far it has been my experience that it does not lessen it very materially.

Dr. J. P. Corley, Greensboro, Ala. I would suggest as a more nearly proper designation for the description of the operation described by Dr. Leonard, the term "pressure cocainization."

The paper by Dr. Burton Lee Thorpe, on "Manual Training an Essential to Dental Education," was read by title. The paper here follows:

Manual Training an Essential to Dental Education.

By BURTON LEE THORPE.

In contending that manual training is a prerequisite to dental education the writer would not discredit or underestimate the skill of the many men who in the past with their mechanical and artistic talent have ornamented dentistry. In reviewing the careers of our foremost practitioners who have made reputations for themselves, it is a notable fact that the majority, before they became famous as dentists, had enjoyed the benefits of manual training in some form or other, and this doubtless developed the skill which they later exhibited in dentistry.

As many of them were mechanics, who would gainsay that the preliminary training obtained in the occupations of blacksmith, barber, traveling tinker—all honorable vocations—did not make it possible for our professional forefathers to accomplish what they did? For instance, Hayden, whom we may safely denominate the "father of dental science," was a carpenter and architect; Eleazer Parmly was a printer by trade; W. H. Atkinson and W. W. Allport were both tailors' apprentices; Elisha Townsend was a watchmaker in his early youth; John Greenwood, a maker of nautical and mathematical instruments; Amos Westcott, an inventor of agricultural implements; Edward Maynard, a blacksmith, civil engineer, and architect, and later one of the world's greatest inventors; S. P. Hullihen, a silversmith by trade; Marshall H. Webb and W. G. A. Bonwill, inventive prodigies; John J. R. Patrick and N. C. Keep, jewelers and diamond-setters; Elisha Neall, a traveling tinker and clock and watch repairer, while many others followed similar vocations, or obtained a crude manual training in early youth on the farm, which is one of the best schools to give the man self-reliance and manipulative dexterity; for it is a fact that when a man is able to *do things,* both mechanical and artistic, he possesses a degree of self-reliance, self-mastery, judgment, and poise of character obtainable by no other means. Having acquired these qualities, he will have an appreciation for the dignity of labor, and will be able to concentrate his thoughts upon things both mental and material.

Probably the best fruit of manual training is the acquiring of the habit of mechanical analysis, which can be learned only by actual work with tools and materials. In ancient times, "Schools were for the study and mastery of books. The arts of the schoolroom were for masters and freemen, hence they were noble and were called liberal arts. The arts of the mechanics were for serving-men, and were acquired only by intimate association with mechanics; so the practical arts were held to be degrading because of requiring a base companionship." Criticisms and objections to educational manual training have appeared with less frequency in later years, and the object and value of such training is rapidly being recognized throughout the civilized world. Men of all ages have recognized the value of skill gained in the use of tools. Time will not permit of our going into an historical *résumé* of manual training, although it is of interest to note that Vulcan, Archimedes, J. J. Rousseau, Peter the Great, our own Emerson, and

many others advocated systematic instruction and practice in the details of an occupation. In days past it was taken for granted that the avenue by which mechanical skill could be acquired lay only through apprenticeship. The progress made in educational matters in the past is nowhere more marked than in the teaching of the mechanic arts. Twenty-six years ago the first manual training school in the world—with a course of study "designed to combine manual with mental training; to put the liberal arts and the mechanic arts side by side; to deal simultaneously with material forces and appliances and spiritual forces and appliances; to cultivate the judgment and executive faculties as well as the memory and the understanding; to extend the humanities so as to include human life, human activities, and human needs as they exist now"—was founded in the city of St. Louis, as a department of Washington University, by Prof. C. M. Woodward, who from that time to the present has been at the head of the institution as its director. In this institution, thoroughly equipped with all appliances and apparatus, the student is taught the fundamental principles of mechanics, mathematics, physics, chemistry, metallurgy, electricity, etc. The course of instruction embraces six parallel lines, as follows:

First: A course of mathematics, including algebra, plane and solid geometry, plane trigonometry, and higher algebra.

Second: A course of science, including zoölogy, botany, chemistry, and physics.

Third: An extended course of English language and literature, including grammar, rhetoric, composition, and history.

Fourth: A course in history or a foreign language, governed by the usual restrictions concerning electives in secondary schools.

Fifth: A course in drawing—freehand, mechanical, and architectural.

Sixth: A course of tool instruction, including joinery, wood-carving, wood-turning, molding, pattern-making, soldering, forging, and bench and machine work in metals.

When a student has completed this course his hand and brain are both trained to produce exact and artistic results. The element of manual labor enters into the life-work of the dentist more than into any other calling. The underlying fundamentals are mechanics combined with art. The writer has been a close observer of the results of manual training, and has noted that the students who have taken this course prior to studying dentistry make very superior dentists —far surpassing the untutored fellow student in technic work. Personal experience, as in manual training, is the only effective way to train and develop the brain cells which control the movements of the hand, and the value of this method of preliminary education to those who would take up the study of dentistry cannot be overestimated.

It may be contended that the dental student has sufficient manual training in the laboratory courses in our schools. Preliminary educational manual training is not training the hand to turn out finished products, as in the laboratory, but the training of the brain through the faculties of perception, with elemental studies of beauty, harmony, precision, and accuracy; and although this of course, may result in some finished product, still it is not the hand-produced article, but the impression made upon the

mind, that is to be valued. If the student be slow of comprehension, dull, uninterested in the principle of mechanics, unable to see beauty in perfectly executed operations upon wood or other materials, and after careful training is not properly impressed with the value of "accuracy of angle and precision of surface," how can he hope to succeed in the practice of dentistry, which is largely a continuation of these precepts requiring much care and skill in their execution!

The writer fully believes that if a course in manual training were a preliminary requirement to the dental college curriculum, the same as an academic preparatory course is a requirement for entrance to any of our great universities, all dentists of the future would be so thoroughly equipped in technical skill that each would be competent to practice dentistry with a creativeness that would greatly enhance the worth and standing of dentistry.

Dr. Hungerford has aptly said that "Science may quarry the marble, but it is the mechanic, the artisan, that chisels it unto the likeness of a god."

The paper by Dr. Wm. H. Trueman, entitled "A Vacancy in Dental Journalism," was read by title. The paper here follows:

A Vacancy in Dental Journalism.

By WILLIAM H. TRUEMAN.

Notwithstanding that there are many dental journals in the United States, and that their objects and aims cover a wide field, yet there remains a vacancy. The scientifically inclined are provided with stately journals that fully meet their needs, while readers who desire to be amused find others wherein science, practical suggestions, and jokes—good, bad, and indifferent—are freely commingled. Betwixt and between these extremes we find well-conducted dental journals devoted to special branches of the science; others that appeal, in a measure at least, to the laity, and are intended as much for the waiting-room as for the office. The colleges have their journals, published in the interests of their students. Not one, so far as the writer knows, on this side of the sea, has been especially devoted to the upbuilding of the dental profession as an organized body. This is the vacancy to which I ask your attention.

That the vacancy exists in this year of grace 1906 indicates an oversight on the part of the profession's leaders.

Organization makes the vast difference in effectiveness between a mob and an army. The dental profession in the United States is a mob. It lacks the inspiration, the discipline, and the unity conferred by a thorough and effective organization. Its many associations interest but a moiety of the profession. They are independent units, each going its own way with but little regard or concern for its fellows. It has no controlling or directing head. It has no mouthpiece. It has no systematic means or methods for reaching its scattered members, or those who newly enter its ranks, to interest

them in matters concerning the profession at large. This aimlessness, this want of organization, subjects its active members to a needless and wasteful duplication of effort in some cases, and leads to working at cross purposes in others. Notwithstanding the many dental journals published in the United States, there is not one to which a practitioner can look for information regarding the profession in his own state, its numbers, its associations, its prospects, or its needs; not one concerned in giving him information on these points regarding the profession at large, its educational institutions, or the legal requirements of the several states. How many can answer offhand, How many dental societies are there in your own state? How many dental practitioners? How many of these are members of a local or of a state society? Where, indeed, let me ask, can this information be obtained? or, when obtained, how can it be made generally known to your fellows? The writer knows of but one publication in the United States that pretends to give information of this kind, or from which it can be gleaned. This is a commercial enterprise, and so expensive that but few can afford a copy.

The result of this is that but few dental practitioners have any knowledge of, or interest in professional societies, and even the members of the societies, as a rule, are satisfied to be interested only in local affairs. Dental practitioners may know, in a perfunctory sort of way, that there is in their state a state dental society, and that somewhere there is a National Dental Association. Society members may be reminded of their existence once a year, it may be, when the local society goes through the form of electing delegates to these important associations, or once in the twelve months when they receive a program of the coming meeting. What are their functions, wherein do they differ from the local society, or what are the relations of the local, the state, and the National Association, the one to the other?—who can answer?

A dental practitioner, unless a member of these distant societies or happening to be a subscriber to the journal in which their proceedings are published, may wind up a long and active life in blissful ignorance of their existence. What is to hinder? They make no effort to reach him, nor to interest him in their affairs.

No one will contend, I am persuaded, that this is a desirable state of affairs.

At this time there seems to be an awakening to the evil associated with this, and a desire and an effort to correct it. The question of interchange of state license is bringing to the fore the want of unity between the states regarding professional requirements, and is leading, slowly yet surely, to a universally recognized standard. Some of the state societies, by a vigorous effort, have greatly increased their membership, and their example will no doubt stimulate others to do likewise. There is dissatisfaction both with and within the National Association and its branches; there is a general feeling that it is not measuring up to its possibilities—and this promises a betterment in the near future. These all are healthy signs.

The dental societies need some means to enable their members to keep in step, to work together, to systematize their efforts and conserve their strength. Furthermore, they need some more effective means than now possessed to reach, bring under their influence, and secure the cooperation of a larger number of dental practitioners. To assist in this the

writer suggests the publication by the state societies at frequent and stated intervals, of a journal especially devoted to the interests of the profession in the state—a journal especially designed to bring about a closer fellowship between the state and the local societies. This should give the name, location, executive officers, the program of each meeting, and now and again the membership list of each local society in the state. In addition to this, such items of information as will tend to keep the state society's progress and needs before the dental practitioners. This might be made sufficiently inexpensive for each issue to be sent regularly to every dental practitioner in the state, and to all others requesting it and willing to pay its cost and postage. This would prove but a slight tax upon the finances of a large state society, while the smaller state societies by uniting could do the same in their bailiwick without embarrassment.

By a similar inexpensive journal, freely distributed to the members of its affiliating societies, the National Dental Association could keep in close touch with the state societies, and through them with the profession at large. The journal of the National Dental Association, in addition to bringing prominently before the profession the state societies, the number of their members, synopses of their proceedings so far as they might be of more than local interest, would of course give prominence to its own affairs. It would invite attention to its own *ad interim* work. The needs of its sections and committees, and the progress made by them, might be helpfully presented from time to time. Its financial statements, laid before the profession in advance of its meetings, would invite confidence and would be suggestive. Changes in the dental laws of the various states, judicial decisions bearing upon them, the more important doings of the National Association of Dental Faculties, of the National Association of Dental Examiners, and of the state examining boards, being matters of general interest, would naturally find a place on its pages, not only in order to give them a wide circulation, but to place them on record where they could readily be found. By confining itself to the business affairs of general interest to the profession; presenting promptly and in a compact and convenient form for preservation and ready reference matters of vital importance not now published—or if published at all, in so scattered a form among many journals as to render them practically inaccessible—such a journal would have a useful field entirely its own, and would assist materially in building up the business end of professional organizations.

Such a journal need not contain a stated number of pages, but may be contracted or expanded in accordance with the volume of matter in hand. The expense of its publication and distribution can well be met by the National Dental Association without embarrassment. If need be, the addition of advertising pages would offset to some extent its financial burden. It cannot expect, at first at least, any revenue from subscriptions, although the state societies might extend a helping hand. For several years the advisability of the National Dental Association having a journal of its own and publishing its own proceedings has been discussed. The attempt by the association to publish a dental journal in competition with those now in existence is not a promising venture. The association has no experience, is not strong

in membership, has no capital, has but little prospect of sufficient financial backing; it cannot command the facilities nor the same careful economic business management as can a well-established, prosperous business house. The dental profession seems well satisfied with its present professional journals. They have served, and do now well serve as exponents of professional progress in science, in art, and in usefulness. In many of them there is much to commend and but little to object to; they are well managed and keep well to the fore. They are supplied at a cost so close to that of their manufacture that competition in subscription price is out of the question. They are satisfactory to their subscribers, to their contributors, and to a majority of the profession. Until the profession is educated to appreciate sentiment above dollars, yards, and pounds, the dental journals as now published will easily hold their own. The time may come when this may be changed; it is not yet in sight. Until then it is best to avoid an experiment in which failure would not only entail a serious financial loss, but would furthermore prove a disaster by discouraging another effort.

By at first, as it were, "feeling one's way," and at a moderate cost entering a new field—one entirely devoid of competition—with the intention of advancing along lines suggested by experience when increased resources make an advance prudent, there will be less risk of failure; and failure, should it come, will be less conspicuous and less disastrous.

There being no further business before Section II, motion was made and carried to adjourn *sine die*.

SECTION III:

Oral Surgery, Anatomy, Physiology, Histology, Pathology, Etiology, Hygiene, Prophylaxis, Materia Medica, and Allied Subjects.

Chairman—G. V. I. Brown, Milwaukee, Wis.
Secretary—W. H. G. Logan, Chicago, Ill.

FIRST DAY—Wednesday, September 19th.

The first meeting of Section III was called to order by the chairman, Dr. G. V. I. Brown, Milwaukee, Wis., Wednesday evening at 8 o'clock, September 19th, 1906.

The first order of business as announced by the chairman was the reading of a paper by Dr. Gordon White, Nashville, Tenn., on "Treatment of Pyorrhea Alveolaris," as follows:

Treatment of Pyorrhea Alveolaris.

By GORDON WHITE.

I esteem it an honor to be asked to tell how I cure pyorrhea alveolaris, since we have many gifted men in our association who have done so much in the line of pathology and treatment of this destructive disease. I bring to you no untried theories, but will briefly describe the treatment which has given me the results which I will later place before you on the screen.

No disease with which we come in contact so absolutely baffles our skill and has its own way in ridding our patients of their teeth and health as does pyorrhea. I think I state a fact when I say that the larger percentage of our profession say unequivocally to their patients, "It cannot be cured; you will lose your teeth." Any other statement to patients who continually do those things which

lower their vitality—such as overeating, using alcoholic drinks and tobacco, or who are indifferent to the hygiene of their mouths and disregard serious functional disturbances, such as intestinal indigestion, etc.—would be reckless in the extreme, and would place a man who has promised a cure in a most embarrassing position toward his practice; yet one might as well say that tooth-decay or malaria cannot be cured under treatment and changed conditions.

Few there are, if any, among us who have not seen clearly manifested in the gums the effect of nearly all constitutional lesions or auto-poisoning, of whatever nature. Any lowered vital or abnormal condition is shown in the mouth, and there is scarcely any pathological condition that an inflamed or suppurating condition of the mouth will not accelerate or produce.

Indeed, in its poisoning effects it works as automatically as does any law of mechanics.

My observation is that nearly all the gum troubles lead to pyorrhea, and in its treatment, even before a thorough examination is made, the mouth is mopped, sprayed, or rinsed with some antiseptic, such as dioxogen, for cleansing. Afterward a general and thorough examination with a smooth instrument is made of all the teeth so affected, and treatment is begun upon the most important ones, or those most involved, by applying to the gum and injecting into the pockets any one of the reliable local anesthetics, and after a few minutes removing the deposits with a rigid, delicate instrument. The success of this operation, in many instances the most delicate in the field of surgery, is greatly dependent upon the thoroughness with which it is performed, for the thin layer of what is commonly called serumal calculus can rarely be seen, and yet can be scraped to an infinitesimal thinness, even with well-adapted instruments, without its removal being accomplished. For do what we may in the treatment, surgically and medicinally, so surely as any of the deposits remain, just so surely will every effort at cure meet with failure.

During the surgical operation of removing these deposits, the patient is permitted at intervals to rinse the mouth thoroughly with some antiseptic wash, the anesthesia being kept up by dipping the instrument in use in a few drops of the anesthetic agent conveniently placed, thereby carrying to the bottom of the pocket on the point of the instrument a minum of the drug each time it is inserted.

Of course teeth which are loose must, in the way deemed best by the operator, be fixed in their positions—bad occlusions corrected by disarticulation, and the teeth placed at rest; for it is difficult to estimate the nervous strain this defect alone produces.

There are many ways of fixing the teeth. The means most frequently used are silk ligatures, united bands, united crowns, and spring splints. The latter, which in many instances have given great satisfaction, are constructed by swaging a piece of gold plate to the lingual and buccal or palatal and labial surfaces, according to the location of the affected teeth, and subsequently uniting these plates with platino-iridium or clasp-metal spring wire, which when snapped over both sides of the teeth is a most excellent method of securing them, and affords easy removal for cleansing. The wire or spring is of course passed from one plate to the other between the mesio-disto-occlusal surfaces.

When some of the teeth are missing, the remaining loose teeth can be made most serviceable by bridges. All roots of molar teeth not attached to their alveoli should be amputated, for the remaining roots, properly treated, can be made to do valuable service for years in the support of crowns and bridges, and where bridges are necessary, they of course make the best possible stays or splints. The cusps of these crown abutments, however, as well as the intervening crowns, should be short or flat, in order to lessen the strain on the delicate roots which always occurs when the cusps are long or high. The bands of these crowns should never be allowed to extend under the gums, for constant local irritation will cause a return of the trouble at these points.

It has been my custom for years to put on bridges that can be removed without difficulty. This is done by lining the crowns and covering the pins with a chloroform solution of gutta-percha or Evans' gutta-percha cement, and as the chloroform evaporates, the crowns will fit closely on the prepared wet stumps. This accomplished, the gutta-percha is dried with alcohol, and the bridge is set with cement as though no lining had been used. I prefer Evans' gutta-percha cement, however, because it melts more easily upon heating than does gutta-percha, should the removal of the bridge ever be necessary.

I do not hesitate to remove the pulp from any of the teeth greatly affected, and where there is enough bone remaining to justify an effort to save the tooth, I have rarely known a case that was not benefited and the usefulness of the tooth prolonged by the extirpation of the pulp. Just why this is I do not know, neither do I know of anyone who does. It may be due to some change in the blood supply to the locality, for among teeth involved to that extent, few contain normal pulps.

After a thorough removal of all deposits, the pockets are washed with warm water. This is followed by injecting very gently a drop or two of pure lactic acid, to which have been added four drops of formalin to the ounce. As both the acid and the formalin are somewhat painful in their action, being rather escharotic, the shallow pockets are usually swabbed out with a little cotton wrapped on the point of such an instrument as a broken Donaldson broach, thus keeping so much of the acid from coming in contact with the mucous membrane. Just here I wish to say that there is nothing better for detecting any remaining deposits, however small, than this little cotton-covered instrument.

Before applying the acid, however, the lips—indeed a considerable area about the mouth—should be smeared with a little oleostearate of zinc—now called emoleo—to prevent the acid from burning, for should it come in contact with the lips or chin it is almost sure to produce what the patient calls "a fever blister" or "cold sore"—although we of course know it to be an eschar.

When the syringe is used, rolls of bibulous paper should be so placed about the pockets as to absorb the surplus acid. I have found nothing better for neutralizing the effect of the acid on the mucous surfaces, or more soothing to the membrane, than to rinse the mouth with milk of magnesia.

These precautionary measures are worth while, for the subsequent suffering is such as to make it a duty to prevent all that is avoidable.

Lactic acid was suggested to the pro-

FIG. 1.

Case I. Right side before treatment.

FIG. 2.

Case I. Left side before treatment.

FIG. 3.

Case I. Right side after treatment.

FIG. 4.

Case I. Left side after treament.

fession for the treatment of this disease a number of years ago by Dr. W. J. Younger. This, combined with a few drops of formalin, as I have suggested, gives me results that I have not been able to obtain from any other agent. However, when the roots are sensitive, I have for many years applied zinc chlorid or a saturated solution of silver lactate, with most satisfactory results. The silver lactate has much the effect of the nitrate, without apparently causing so much or so dark a discoloration.

After the surgical and medicinal treatment the pockets are not disturbed for a week or ten days, but the official tincture of iodin is applied to the gum about every other day, and the patient directed to use some antiseptic mouth-wash half a dozen times daily. Should the pockets then show no sign of healing, it is perfectly certain that there is something remaining in them which should be removed, either a scale of deposit or some foreign substance which has lodged and acts as an irritant, and which demands that the surgical treatment be repeated from time to time until healing occurs.

It is my practice to keep under my observation each case until the recovery is manifest, for in no other way can the wound be kept clean from irritating agents, such as particles of food, etc. I consider it quite as necessary that the dental surgeon should look after his cases of pyorrhea after the operation as it is for the general surgeon to see his cases after major interventions. As the latter's cases need dressing, just so do our cases of pyorrhea need attention. Absolute cleanliness is necessary. As nothing so delays a cure or causes a return of the disease as filth, I show my patients how to clean their teeth, and insist on their doing so with a good stiff brush, for three minutes, not less than five times a day; on arising in the morning, after each meal, and just before retiring.

Massaging the gums with the fingers is always of the greatest benefit, and I demand that this be done frequently, and as thoroughly as possible. Let me say that on the dismissal of the case I always urge an occasional visit, and the hygiene of the mouth may be looked after and irritations relieved, to prevent any recurring inflammation; for should the patients again become indifferent to their general condition, and careless as to the care of their mouth and teeth, the osteoclasts will resume business.

As to constitutional treatment, much more depends upon the manner of living than upon the administration of drugs. To quote Dr. C. N. Peirce, "When I have gotten my patient to drinking water, I think I have accomplished much toward a cure of this dreaded gum disease;" so one of my most urgent injunctions is to flush the sewers, take an internal bath.

The customary diet of white bread, red meats, starches, sweets, etc., is changed for one of coarse breads—made of pure graham flour and country corn meal—nuts, fruits, and vegetables, with the caution against overeating.

The importance of deep breathing, exercise in the open air, and well-ventilated sleeping apartments is insisted upon. In other words, the patients are impressed with the importance of wholesome living, and made to feel that conditions must be changed, and that their co-operation is a necessary factor to the success of the treatment.

Occasionally one of the tonics or alkaline agents is prescribed, with more or less favorable results. In cases of a torpid liver, calomel is often a valuable

agent. My general practice of late years, however, has been to put as few drugs as possible into my patients' stomachs.

CASE I.

Figs. 1 and 2. These casts represent the mouth of a lady fifty-seven years of age, anemic and rheumatic, who had for years lived principally on meats and sweets, white bread, pastries, etc. It practically shows the case as it fell into my hands, wearing an old celluloid plate to fill the spaces caused by the loss of teeth, except in the case of the crowns of the upper right first bicuspid and upper right second molar, upper left second bicuspid and upper left third molar, and lower bicuspids, the roots of these teeth having been prepared to receive artificial crowns, and side bridges were made before saving the cast was thought of. As you see from the illustration, it is a pronounced and serious case of pyorrhea alveolaris; the gums are greatly swollen and pus is oozing from the socket of every tooth; all the teeth are very loose, save the lower bicuspids and upper left second bicuspid; the alveolar septa between the upper right second and third molars is entirely gone; also from the mesial surfaces of the upper left third and lower third molars the instrument could be easily passed to the curves of the apical ends of the roots. There was a great waste of process around both the upper canines and lower incisors, as can be readily seen in the accompanying illustration; indeed the upper canines were so loose that the cusps could be brought about half an inch nearer to each other with the thumb and finger; besides, the right canine was the seat of a chronic abscess, discharging at the margin of the gum. This tract was thoroughly scraped, also the apical end, the canal was filled in my usual way, and the pyorrhea treated as heretofore described. The crown was disarticulated, which, in a measure, put the tooth at rest.

The molars and bicuspids were cut off, one side at a time, which put those roots at rest.

Notice that after the upper left third molar was prepared for the band, it was much lower than the summit of the ridge. I hesitated before undertaking the treatment of this tooth, so great was the waste of process and so loose was the tooth. The lower incisors were ligated with silk thread for four months, at the end of which time they had become tight and comfortable. The side bridges having been made one at a time, thereby preserving the natural bite, the bridge to supply the lost upper incisors and bone under the lip was now made. For this purpose you will see from Figs. 3 and 4 that a two-incisor gum section for vulcanite work was made use of, and answered the purpose admirably. This last bridge, however, was locked to the side bridges by lugs put into the crowns or the gold grinding surfaces of the bicuspids, thereby making a continuous bridge of the entire upper jaw except the right third molar. The lower bridges were made of the "saddle-back" teeth, except the crowns of the third molars, which of course were supplied with the usual gold shell crowns.

Six months were consumed in the treatment of this case, soon after which time the patient had gained twenty-seven pounds. She had regained her former agility of step, the roses had returned to her cheeks, and she looked to be thirty-seven instead of fifty-seven. This was eight years ago. I saw her recently, and can assure you that her mouth is in

a thoroughly healthy condition. Needless to state that the diet and her entire habit of living were changed in the course of treatment, and that no drugs were given internally. Figs. 3 and 4 show the case as I dismissed it, and as it is today.

CASE II.

Figs. 5 and 6 show the casts of the mouth of a maiden lady forty-seven years of age, suffering from one of the most serious cases of pyorrhea I have ever seen. Every tooth was loose save the lower right third molar. She also suffered from torpidity of the liver, constipation, intestinal indigestion to a rather unusual degree, and was a typical case of uric acid diathesis. Before the impressions were taken, that I might not remove some of the teeth with the impression, an old upper bridge anchored to the upper right second bicuspid and first molar was removed, the bicuspid root coming away with the bridge. Finding no attachment, distally and lingually, of the lower left bicuspids, the crowns were cut off at their necks, disarticulating and putting them at rest; the pulps were extirpated and the canals filled. The lower left second molar was split with a dentate fissure bur, and on removing the distal root, no bone whatever was found on the distal side of the remaining mesial root, or the mesial surface of the mesial root of the third molar, nor was there any process to be found on the disto-buccal and lingual sides of the lower right second bicuspid, or the mesial surface of the mesial root of the lower right first molar. The roots of the upper right molar, which had held the bridge, were resting in about a quarter of an inch of bone, and consequently the bifurcations were greatly exposed, both mesially and buccally, allowing the instrument to pass readily in both directions. The buccal plate of the alveolar process over the roots of the upper left first molar was entirely gone, and naturally the buccal bifurcation, as well as the buccal surface of the buccal roots, was wholly exposed.

I extracted in this case the upper right lateral, the lower left central and lateral incisors, and the canine, as each of these teeth, by reason of its slight attachment, would have dropped out at the least provocation. As I progressed in my study of the case, I found I could not use the lower right third molar, and though it was the only firm tooth in the mouth it was extracted.

After removing the pulp from the lower left third molar—a procedure which in connection with bridge work I always follow—and filling the canal of the remaining root of the second molar, gold crowns were made, gold caps being made for the bicuspids and lower right central and lateral, using no pins. Thus a bridge was constructed for the entire left side of the mandible, extending to the lower right canine, using the saddle-back teeth for the bicuspids and for the molar dummy. Of course the lower right canine, bicuspids, and molars, and the upper left teeth were artistically treated before the impression for the bridge was taken.

The upper right first molar roots having now become quite firm, the bridge was made, and anchored to these roots, to the canine, and to the central of the same side, as shown in Figs. 7 and 8. It is not necessary to say that quantities of pus flowed from under the gum, and that it was in no way an encouraging case. It was treated as set forth in my paper, and the patient was at first instructed to take a full dose of calomel. At the end of

the fifth month the case presented the appearance seen in Figs. 7 and 8, with not

Fig. 5.

Case II. Right side before treatment.

Fig. 6.

Case II. Left side before treatment.

a single red spot on the gum. When seen again, about sixty days afterward, the patient had regained her health and increased her weight about twenty-three pounds. About six years have elapsed since the treatment of this case was ter-

Fig. 7.

Case II. Right side after treatment.

Fig. 8.

Case II. Left side after treatment.

minated. I saw the case again, however, about two months ago, and both the mouth and the general health seemed to be perfect.

CASE III.

Figs. 9 and 10. I found this case apparently hopeless, and it had been so pronounced by a specialist in pyorrhea. The

teeth seemed to have almost no attachment to their sockets. The upper centrals, however, were comparatively firm for a mouth in this condition. The patient, a maiden lady aged forty-six, was in poor general health, and in every way the outlook was most discouraging for saving any of her teeth at all. She had swal-

Fig. 9.

Case III. Right side before treatment.

Fig. 10.

Case III. Left side before treatment.

lowed such an amount of pus that her face was of the same color as the pus. other molars of the jaw had long since dropped out, as well as the upper right

Fig. 11.

Case III. Right side after treatment.

Fig. 12.

Case III. Left side after treatment.

Upon a thorough examination it was considered useless to try to save the upper left first bicuspid and first molar. The bicuspids and first molar. So loose were the teeth of the lower jaw that no attempt was made to save the right first and the

left second molar. After the surgical treatment and general directions as to the teeth which had been left in the mouth astonishingly tight, except the up-

Fig. 13.

Case IV. Right side before treatment.

Fig. 14.

Case IV. Left side before treatment.

living had been given, the patient was sent to the mountains for two months. On her return, I was delighted to find per right second and third molars, which were still very loose. The mesio-buccal root of the second molar was by this

time wholly unattached, and the distal root was attached only on the lingual side, the attachment fortunately extending to and including the apex of the root. As clearly shown by Figs. 11 and 12, the mesio-buccal and distal surfaces were entirely exposed, save the apex itself. After filling the canals of the roots the mesial root was amputated at the bifurcation, and though the distal root was greatly

Fig. 15.

Case IV. Right side after treatment.

Fig. 16.

Case IV. Left side after treatment.

exposed, the two remaining roots of this molar, as well as those of the third molar —which was greatly involved, with practically no bone left on the mesial surface —very soon became sufficiently tight to justify bridging along with the canine and lateral. For the left side of the maxilla a bridge was made, anchored to the lateral incisor, canine, and second bicuspid roots, with a porcelain-faced dummy molar extension, the mesial half of the occlusal surface striking the distal half of the gold crown below, this crown being united to a gold crown on the first bicuspid, the second bicuspid having been lost early in life. On the right side of the mandible was constructed a small gold bridge of three teeth, uniting the second bicuspid and second molar to a small gold dummy filling the space of the extracted first molar.

Referring to Figs. 11 and 12, it will be seen that these gold bands were made very short, so as not to cover the bifurcations of the roots of the molars; for after the gums had regained their health there was an unusual exposure of all the roots in the entire lower jaw.

Having artistically treated the lower anterior teeth and the two upper centrals, the case was dismissed. In two or three months the patient was greatly restored in health, and had gained twenty-five pounds in weight. This was four years ago, and when last seen, about eighteen months ago, the mouth was in excellent condition, the teeth much tightened, and there was no redness of the gums whatever.

CASE IV.

Figs. 13 and 14. This case shows great loss in the number of teeth, as well as considerable loss of the alveolar process, especially in the left side of the upper and lower jaws. The upper right first and third molars, the lower right second molar and first bicuspid were very loose. These teeth were disarticulated, except the bicuspid, and as no attachment was found of the palatal root of the upper right first molar and the distal root of the lower second molar, the teeth were split, and the roots were removed before an impression was taken. The left third molars were also loose; indeed, she had been advised to have all the remaining posterior teeth extracted and plates made to carry the artificial substitutes. The lower six anterior teeth were found loose, the central incisors being almost ready to fall from their sockets. These were immediately disarticulated, and after the surgical and therapeutic treatment began to tighten. The mesial root of the lower right second molar, I think, was the most hopeless case I have ever saved. There was absolutely no attachment whatever, except on the mesial surface, and as it had leaned forward so much it appeared as though lying on its belly, thereby allowing an instrument to pass over the end of the root without the least resistance.

Soon after the removal of the distal root, however, it straightened up in its position astonishingly, after a time becoming quite firm, and joined the bicuspid in supporting a very substantial bridge, opposing the bridge of the upper jaw supported by the canine, buccal roots of the first molar, and the third molar, as clearly seen at Figs. 15 and 16. The upper front teeth were in comparative health though loose, and there was practically no waste of the alveoli. There was some waste on the mesial surface of the upper left third molar. The lower left molar was very different, there being much waste of bone, involving both the mesial and lingual sides and extending

almost to the end of the mesial root. The root-canals of these molars having been filled, as well as those of the canines, unusually long bridges were made to restore the extensive loss, as may be seen in Figs. 15 and 16.

The patient is a lady about forty-eight years of age, who had suffered for a long time from indigestion and rheumatism and was in a low state of health. She fell into my hands about two years ago. After a year, more or less, of irregular treatment, we reached the condition shown in Figs. 15 and 16. I have seen her a number of times within the past year, and upon the occasion of each visit I am forced to stand a good round scolding—not for her good health, but on account of an increase in weight of thirty-five pounds.

Fig. 17.

Case V. Lower right side after treatment.

Fig. 18.

Case V. Lower left side after treatment.

Fig. 19.

CASE V.

Figs. 17 and 18 show the condition of the lower teeth of a patient under treatment.

Fig. 19 shows one of those splints referred to in my paper, which was worn in the early part of 1897 for six months to support two upper centrals. Those two teeth are now in excellent condition.

Discussion.

Dr. L. G. Noel, Nashville, Tenn. I believe I was selected to open the discussion on Dr. White's paper because I was at one time associated with him, and am still practicing in the same city with him and can tell what he is doing along this line. He has produced some very marvelous results in the treatment of these cases, and it gives me great pleasure to state that he has thoroughly mastered many cases that would baffle almost any of us. In beginning his treatment he succeeds in impressing his patients with the fact that he is master of the situation, and he dominates and controls them to such an extent that they will do anything he demands and believe anything he says, and that is one reason why he succeeds so well with his cases.

I am somewhat inclined to criticize the opening sentence of the paper, in which occurs the phrase, "how I cure pyorrhea." Now I object to that because I do not believe anybody ever *cures* pyorrhea, but rather only relieves the condition. The essayist states farther on that the patients who follow his suggestions as to constitutional treatment, and come back for local treatment faithfully, are the cases in which he obtains his best results—a statement that will coincide with the observation of most of the older practitioners.

Dr. White succeeds in impressing his patients with the serious nature of the disease, and I can say that he gets results that are very wonderful to me, and which I have very seldom seen in the hands of other practitioners. I wish he had exhibited the instruments that he uses to remove the tartar. He has in addition to his power to impress the patients with the evil results of this disease, a wonderful touch in the removal of the deposits. It has always been my belief when the disease has extended beyond the bifurcation of the roots that the case is hopeless, but Dr. White will often amputate a root and save parts of teeth only, for the attachment of the crowns, thus bringing about wonderful results.

It gives me great pleasure to state that I have seen many of the cases years after his treatment, and it has been a surprise to me that the original condition of inflammation in the gums had not set in again.

Dr. A. W. Harlan, New York, N. Y. I have been very much interested in the pictures presented by Dr. White and have seen some of the models, in fact I have seen all of them, and must say that the results of this treatment are apparently very satisfactory.

In the treatment of loose teeth we must recognize certain things. At the present time the question of the causation of this condition is still in dispute, because there are many factors to be considered in the matter. We have some constitutional diseases and we have some local troubles to contend with which must be recognized. The man who, when standing before you, continually blows his breath at you, is one who is a victim of what might be considered a potent factor in the causation of loose teeth—mouth-breathing.

The illustrations in Dr. White's paper

explain themselves, but we must go back of that. There are many conditions contributing to the causation of loose teeth, which have not been considered fully in any paper or presentation of this subject. I only have to say that I believe, in order to arrest any condition that will cause the loosening of the teeth, there are in addition to constitutional treatment some local operations that are absolutely necessary. The first thing is that the teeth must be held firmly in position; secondly, the roots of the teeth must be thoroughly deprived of any extraneous concretions or accretions of deposits, so that the tissues will have an opportunity to return to their normal shape; thirdly, we must have cleanliness, and that is a matter which every man must determine for himself. We must also have occlusion of the teeth so that irritation may not be kept up by malocclusion, and our object can only be accomplished by cutting and grinding, all of which I think Dr. White has brought out in his paper.

Dr. M. L. Rhein, New York. Before showing some slides that I wish to exhibit, I wish to personally compliment Dr. White on the results which he has presented to us. What I have to say this evening is entirely on this subject, but upon a somewhat different phase of it. I want to call attention to the fact that in pyorrhea alveolaris, loose teeth, Riggs' disease, pathological conditions of the peridental membrane, or any other name you wish to use in discussing this subject, the important point to consider is the one that presents itself to every dentist and every physician when any case of disease comes before him, and that is the question of diagnosis, and what is more important still, the question of differential diagnosis. The two important points to be considered are the exciting cause and the predisposing cause. I wish to especially direct your attention to the fact that the difficulty of treatment of these conditions—which are such a factor in the destruction of teeth and the reason why the profession at large has met with the poor results of which so many complain—is because the treatment has been pursued in an empirical way. Empiricism has been the retarding factor in the progress of our specialty since I can remember, and as we leave its realm so are we able to advance gradually toward success with our treatment, and bring such results as Dr. White has shown us, not occasionally, but invariably and understandingly. I claim that if you know what you are treating, you know how to treat the case, and you are also able to tell your patient in advance what the results will be of your treatment.

The slides I shall show you are made from radiographs—not photographs—showing absolutely every portion of the tissue from the enamel down to the end of the root. Necessarily, and unfortunately, slides of this kind on account of their density do not show up so well on the screen as the ordinary photographic slide can be made to show. I therefore ask your indulgence for them in this respect, and will endeavor to make clear the points more easily discernible by those who are accustomed to examine and interpret radiographs.

The first thing necessary in order to formulate a correct diagnosis of conditions of this kind is to know the difference between the physiological normal alveolus and the one in which pathological conditions exist. Now I shall show you two slides of cases where there was a local condition that might be called pyorrhea, but in both cases the alveolus is abso-

lutely normal, and you will notice the great differentiation in the alveoli in these two cases from those which are pathological. The first, Fig. 1, is the case of a monkey that I obtained at the Rockefeller Institute in New York. He was inoculated in the course of investigations on spinal meningitis. This monkey died finally from inanition, and the director of the institute called my attention to the great amount of calculus deposit around the teeth, and I thought we had a good case of pyorrhea; so I turned the specimen over to Professor Broomell, and to our astonishment we found a normal alveolus. This illustrates what happens so often in practice, where we see many cases in which deposits are simply the localized expression of a constitutional disorder. This difference can be seen in the other slides. The density of the radiograph does not enable us to bring it out so clearly, perhaps; however, they show absolutely all of the portions of the alveolus, which is intact. All of the white substance is osseous tissue, and there appears to be no destruction of any portion of it. It shows a perfectly physiological jaw, although there is a great amount of calculary deposit, and it is therefore a most interesting specimen to study in comparison with pathological specimens.

Fig. 1.

This next case, Fig. 2, was one of a loose bicuspid, and the patient was referred to me as one suffering from pyor-

rhea and demanding attention. The radiograph, while it shows an absolutely healthy condition of the osseous structure, presents one pathological point: A

Fig. 2.

careful examination of the radiograph shows that inflammation of the pericementum had existed, and that the looseness of this bicuspid was entirely due to local irritation brought about by a badly made gold shell crown, the exciting cause of the inflammation in the peridental membrane. The removal of the pulp and the proper crowning of the tooth effectually cured the case.

Now I will show you in contradistinction one of the ordinary types of pyorrhea in which considerable destruction of the tissues had taken place. (Fig. 3.) Here is the neck of the tooth; the bone is absorbed down to this point [indicating], and although in these cases the gum may extend to its normal position, the bony septum between the teeth may, as here, be lost. The value of the X ray both in diagnostic work and in treatment is exemplified in this case. Dr. Harlan has mentioned one of the axioms in the treatment of cases of this kind, that "Every particle of these deposits must be removed." Now it is impossible for any deposits to be on these teeth that the radiograph would not show. Very frequently, however, the operator is deceived about this thing. Often the patient, as Dr. White has said, will come back, which means that deposits still remain. This X ray shows the accretion on the side of the root most beautifully.

The main thing I have to say is that the X ray is an aid to correct diagnosis; but I do not care to have you construe this remark as meaning that the X ray can be absolutely depended upon, for that would be going to the extreme, and would not be warranted by the facts. In the first place, you must accustom yourself to the examination and study of the X ray in order to understand what you see, and even then we are sometimes deceived. On that account I simply present it to you as an auxiliary in diagnosis.

This next case, Fig. 4, is one that I present to you in order to show where the X ray in itself is deceptive in what it

Fig. 3.

shows. In other words, even one who is careful in making a study of radiographs can be deceived by this picture. We have an upper second bicuspid, with a light line surrounding the apex of the root. When you see an area of this nature anywhere around the root of a tooth in this condition, it is an indication of the existence of an abscessed condition, and is one of the most valuable diagnostic signs we may obtain with the radiograph. It invariably reveals peri-

cemental abscesses in teeth with vital pulps.

This is a case that was transmitted to my care by my father-in-law about fifteen years ago, and which had been in his hands for a number of years. (A great many of the members present will undoubtedly still remember the name of Dr. Odell.) In the treatment of that patient's mouth I was careful to avoid doing anything to this tooth, because it was a beautiful restoration of a tooth with a gold filling that had been in place up to a year ago for over thirty years. About a year ago the patient complained of neuralgic symptoms in this region, and to aid in diagnosis I made this radiograph, which fails to disclose any root-filling. I had supposed that this large gold restoration was over a pulpless tooth with a root-filling in it. You see how plainly the radiograph shows a loss of root tissue—the tissue being absorbed at the end of the root with this long-standing abscess around it. This had finally proceeded to such an extent as to cause severe pain to the patient. Now here is where the radiograph deceived me. In exploring the root-canal I found to my astonishment that that root was thoroughly filled to the end with cotton. I had never seen a cotton filling before that did not smell. There was no odor from it, and it was packed tightly to the end of the root, and was one of the most difficult fillings I ever had to remove. I simply call your attention to the fact that the cotton root-filling does not show up.

Fig. 4.

You will notice in the adjoining first bicuspid, which I crowned some years ago, the root-filling extending to the end of the root quite distinctly. This case was entirely cured by means of the electrolytic treatment. The electrode was passed through the opening in the root into the surrounding tissue, the area absolutely disinfected, and the root-filling restored—a very satisfactory result ensuing.

The next slide, Fig. 5, shows a loose lower third molar with deposits and pus, a type of case that a large portion of the profession would take for a pyorrheal case pure and simple. This was my opinion until I took an X-ray picture, and found this amalgam filling entering the pulp-cavity, with no sign of the pulp ever having been interfered with. It turned out to be simply a case where the exciting cause was an improperly inserted amalgam filling which had caused the death of the pulp.

Fig. 5.

The next picture I ask you to notice, Fig. 6, shows an upper lateral with vital pulp and a pericemental abscess at the apical region. This patient is a member

of the New York State Dental Society, and came to me with a pyorrheal condition of the mouth, and this tooth, a lateral, was the one most affected. The picture shows the pyorrheal condition of the tooth, with the absorption progressing at the end of the tooth. The removal of the pulp and the filling of the root cured the case.

Fig. 6.

The next case, Fig. 7, is a case of marked pyorrhea that I would designate as gouty—pyorrhea arthritis—a case in which the condition is most marked. The pulps are almost obliterated by the

Fig. 7.

filling up of the pulp-chamber with secondary formations. These are the cases that give trouble in treatment, because of the difficulty in filling such canals to their ends.

The next slide, Fig. 8, is a case showing a marked condition of pyorrhea around a lower molar, complicated with an alveolar abscess. The next molar has been properly treated by removing the pulp and filling the canals. I want to call your attention in this radiograph to the

Fig. 8.

differentiation of the tissues, and also to the inferior dental canal, which is distinctly running along below the molar.

The next case is a very interesting one, and will be shown by the four succeeding slides. The first slide, Fig. 9, shows an abscessed condition over these bicuspids. In the molar is the evidence of an old root-filling of one of our ablest dentists in New York city. The lingual root had been partially lost, and the filling is seen protruding beyond the absorbed end of the root. The next slide, Fig. 10, shows the opposite side of the same patient's mouth, where the conditions are worse. This patient was referred to me to see if I could possibly save these two loose molars. A great many dentists had seen the case, and all claimed that the teeth were so loose that nothing could be done with them. They were almost ready to drop out of their sockets; it is hard to realize how little retention they had. You will notice that an attempt has been made to open into the buccal and lingual canals of these teeth, which was unsuccessful on account of the filling up of the canals with secondary matter—but it is useless to treat such cases unless the canals are cleaned

and filled to the ends. The next slide, Fig. 11, shows these two molars after the buccal canals have been properly filled. There was no attention paid to the lingual roots in either of these teeth, because both the lingual roots had lost all of their attachment and had become necrotic appendages which had to be amputated. After removing the roots I replaced them by porcelain substitutes, as I have described in some of my papers in years gone by. The mere treatment of these teeth, the simple removal of the pulps and reproducing the lost lingual root, was not all that was necessary. It was necessary, as the preceding gentleman has said, to hold the teeth fixed. I am opposed to the use of bands for that purpose, for reasons which I will not enter into now. The method used here was

Fig. 9.

Fig. 10.

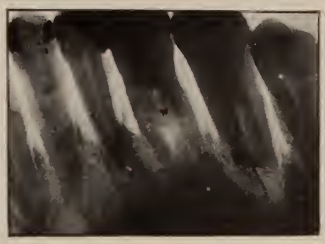


Fig. 11.

Fig. 12.

Fig. 13.

Fig. 14.

to run a platino-iridium wire into the porcelain root that was placed in position in the second molar, running it up across the occlusal surface and into the pulp-cavity of the first molar. The same condition was observed in the first molar. A platino-iridium wire in the porcelain root was carried across the occlusal surface and into the pulp-cavity of the second molar. All this was done at one operation, and the wires were cemented into place by means of amalgam. The illustration, Fig. 12, shows the finished operation. It shows the porcelain root of the second molar and the platino-iridium pin as it extends and crosses over into the first molar. The dark mass is the amalgam restoration which firmly holds the two teeth together. The porcelain root on the first molar, for mechanical reasons I thought best to leave at the angle shown instead of at right angles, believing that I should thereby get better retention.

And here I want to call your attention to a very vital point in the treatment of loosened teeth in holding them together by splinting. It is usually thought when you splint loose teeth together, that in order to hold them firm it is necessary that they should be attached to a tooth that is not loose. That is a common error. Two loosened teeth splinted together will be firm, for the reason that the roots protrude through the alveolus at such divergent angles that they pull against each other, and produce the firmness which we desire. That is an important point which I do not believe has ever been brought clearly before the profession.

The next and last case I consider also as one of the extreme ones. What I am trying to demonstrate here is that many cases said to be hopeless can be saved. Fig. 13 shows a lower central incisor in the mouth of a young married woman. The alveolar attachment is almost entirely lost. The pyorrheal area is well marked. The pulps of this and of the adjacent teeth were removed and the ends of the canals filled. A splint of the shape of a three-pronged fork was then made of iridio-platinum, attached to three inlays filled into the three pulpal openings and then cemented into the three roots. The last slide, Fig. 14, shows the completed operation.

Further discussion of Dr. White's paper was deferred until after the reading of the next paper.

The chairman then announced as the next order of business the reading of a paper by Dr. H. J. Allen, Washington, D. C., on "Lymphatic Stimulation in Dental Practice," as follows:

Lymphatic Stimulation in Dental Practice.

By H. J. ALLEN.

It is only during recent years that the lymphatic system has received from physiologists the attention which its importance demands. All the older physiological text-books give only a vague conception of the mechanism of the system, and few venture to impart any information as to its functions.

The development of special knowledge of these functions has been consequent

upon, and coincident with, our increasing knowledge of the bacterial origin of disease. Pasteur, Koch, Behring, Metchnikoff, and Foster have within the last decade made astounding discoveries relating to the functions of the lymph stream, which have revolutionized the treatment of infective diseases in general.

As one of the results of these discoveries a number of pseudo-scientific geniuses have applied the forceps to their respective imaginations, and delivered full-fledged systems of lymphatic therapeutics which they are certain are going to revolutionize the accepted theory and principles of general practice.

Osteopathy, which is the pseudonym under which a large percentage of the public are at present having their lymphatic systems stimulated, bears about the same relation to the regular practice of medicine and its collateral branches that astrology bears to the science of astronomy.

The good and the bad, the true and the false, theories and facts, are merged and cemented together by the imaginative intellects of second-hand discoverers and inventors of systems, who do not hesitate to utilize any fad, fact, or fancy, in order to put their systems on a dividend-paying basis.

Still, under the spangles of the mountebank, true therapeutic worth lies concealed. Vibration administered by empirics has unquestionably produced in some cases most excellent if not marvelous results, and it must follow that this physical method in the hands of a conscientious and thorough man—one who pays strict attention to his pathology, physiology, and anatomy—will produce results that are almost miraculous in certain cases.

The art of massage and manual manipulation dates from the most remote antiquity. Thousands of years ago the Chinese had written treatises on the subject, and Hippocrates makes frequent references to the subject in his writings. In one paragraph he says, "Rubbing can bind a joint that is too loose, and loosen a joint that is too rigid. Much rubbing causes parts to waste, while moderate rubbing makes them grow."

Hippocrates was also the first to record the employment of mechanical vibration —"wrapping one end of a saw with cloth that was applied to the part to be treated, while sawing a piece of wood with the uncovered portion, thereby producing vibratory oscillations in the affected part."

Galen and Paracelsus also used and advocated similar methods in their practices.

From these remote times until the present, methods of vibration or massage have waxed and waned, until at the present day vibratory massage has come to be recognized by the medical profession as an efficacious procedure in the treatment of numerous local and constitutional disorders. And yet today's researches reveal only how much more complex is the body's metabolism than yesterday we thought it to be, and in the problem of vibratory therapeutics there is certainly much more before us than behind us. Lying as it does on the border zone where the physiologic and the pathologic meet, it reaches far into both, and obscures the division line between them.

In any disease the organism makes a constant effort to recover "that just balance which we call health," and now that it is possible for the physiologic and metabolic forces of the body to be marshalled and intensified in order to assist this effort by vibratory treatment applied with intelligent persistence, we can but feel

that the armamentarium of the medical and of the dental therapeutist has been greatly increased in efficiency.

A succinct review of the lymphatic system—which is the main function of the body affected by vibratory massage—would not be out of place at this juncture.

The name is derived from the Latin word *lympha,* water, and in view of the knowledge on the subject at the time this name was given, could well be termed the "water-system" of the body.

The system consists of vessels and glands that commence in a series of lymph capillaries in the organs and tissues of the body, and terminate in two large trunks which open into the larger veins near the heart—the thoracic duct on the left and the right subclavian trunk on the right. The vessels are very thin, vary from transparent to translucent, and permeate all tissues excepting the non-vascular structures, such as the hair, nails, and the enamel and dentin of the teeth. They are beaded in appearance, being interrupted in their course by constrictions which lately Foster and Ziegler have agreed are valves which act similarly to those of the veins, and serve to give impetus to the flow of the lymph.

The glands of the system vary in size from that of a small seed up to that of an almond, and are situated in the course of the vessels. A lymphatic vessel, before entering its gland, breaks up into several branches which are known as afferent. The vessels as they leave the gland are called efferent.

The lymph capillaries are made up of a single layer of endothelia, whereas the larger vessels and glands have a middle muscular coat and an outer adventitious one. This structure at once makes apparent the perfect drainage the lymph capillaries afford the tissues, and the mechanism by which the products absorbed by the capillaries are passed on by muscular contraction to the larger vessels *en route* to the point of elimination.

The lymphatic glands are now confidently claimed to be the points of origin of the white blood corpuscles—or phagocytes—and Metchnikoff was the first investigator to direct particular attention to the important part played by these lymphocytes or corpuscles in maintaining health and destroying pathogenic germs.

Here it may be mentioned that the general tendency is to overlook the absolute importance of the lymph flow of the body, and to think of the blood as the sole nutrient fluid of the economy, but the fact is that the blood nourishes the tissues only through the agency of the lymph. Sir Michael Foster calls lymph the "middle man," by means of which a double interchange of material takes place between the blood within the capillaries and the tissues outside of them. The rapidity of the process can be partly comprehended by the fact that it is estimated that the entire volume of blood passes through the lungs once in every twenty-four seconds.

In addition to giving origin to the lymphocytes and acting as temporary reservoirs for the lymph, the glands also drain the tissues adjacent to them, and are consequently important factors in the process of absorption.

Lymph comes into more intimate relation to tissue metabolism than even the blood, conveying as it does nutriment to the tissues, and receiving from them in return the products of cellular activity. Lymphatic glands are therefore both secretory—producing the lymphocytes which become converted into phagocytes

after passing into the blood—and excretory—draining the waste matter from contiguous tissues and discharging them into the circulation; and both of these functions are performed simultaneously. They are prone at times of lessened vitality to become overloaded with waste or poisonous products, which partly inhibits their function.

These glands, although rather sluggish in their natural action, are highly responsive to stimulation, and their excretory function may be very materially increased thereby. There is but little doubt that their natural torpor arises from the toxic effect of the waste and deleterious matter which drains into them from the surrounding tissues, and for which they act as reservoirs.

From this rather hasty review of the structure and functions of the lymphatic system, it will readily be seen that it is of supreme importance in the general metabolism of the body, and the perfect functioning of the economy depends on the integrity with which the lymphatic system performs its dual office.

Now as to the therapeutic aspect of the subject. The results obtained from the practice of vibratory massage by the most competent practitioners may be epitomized as follows: (a) Energetic stimulation of the lymphatic and arterial vessels and glands; (b) Dispersion of exudations; (c) Increased secretions of the mucous membranes and glands.

As a general proposition it may be said that the method can be used with the greatest success in all subacute and chronic diseases. Dr. Lorenz has recommended it in chronic joint diseases, and has also suggested its employment after any operation in which it is desired to increase the nutrition of the part and to hasten recovery.

Dr. S. J. Meltzer of the Harlem Hospital, New York city, has stated, as a result of a series of experiments, that the growth of bacteria is absolutely inhibited by continued vibrations. Similar reports have been made by foreign investigators.

In view of such a range of therapeutic activity, the application of this method to the treatment of pyorrhea alveolaris and alveolar abscess is apparent.

In the treatment of pyorrhea alveolaris, after the thorough scaling of the roots of the affected teeth and the complete disinfection of the pockets with iodin, zinc iodid, or any of the acids used for the purpose, the patient is ordinarily dismissed with more or less explicit instructions to take excellent care of the teeth and mouth. This is where a mistake is ordinarily made. The operator should not dismiss the patient until after the complete convalescence of the gums, and until he is assured that the care he has advised is exactly suited to the individual case under treatment. This care should invariably include stimulation of the lymphatics of the gums by massage, administered by either patient or operator or both—the patient using either a rubber cot brush, towel, or finger; the operator at such intervals as his judgment dictates either applying or advising the application of mechanical vibratory stimulation by the appropriate apparatus—a variety of which have been placed upon the market.

Thus the lymphatic system of the gums will be kept so active that exudations will be either prevented or more readily absorbed, and the progress of the disease will be reduced to a minimum.

I tell patients suffering from this disease that the amount of trouble they will have from it will bear a persistent ratio to the lack of personal care and profes-

sional treatment—emphasizing both personal and professional treatment as of equal importance, each one supplementary to but under no circumstances a subtitute for the other.

When the common membrane of a tooth and its socket becomes inflamed from any cause and its structure infiltrated with serum, how is the surplus serum—that amount in excess of what is needed to repair the parts or restore them to a normal or approximately normal condition—how is that excess to be disposed of? By one of two methods; either the lymphatics of the adjacent tissue must absorb it rapidly enough to prevent disintegrating changes taking place, or else the accumulated serum becomes the pabulum of an innumerable host of pyogenic organisms and an abscess results, with or without a fistula, according to the vitality of the patient or the activity of the lymphatics involved.

As to the best method of allaying peridental inflammation and absorbing the prospective abscess in such cases: If there is any better method than that of first removing the cause, and then stimulating the adjacent lymphatic glands, it would seem that it is yet to be generally learned.

Simply removing the cause will result in a slow cure for the majority of cases, but as the average practitioner always succeeds in a majority of his cases, we can consider that it is the minority that tests his therapeutic wits, and it is in reducing that difficult minority that lymphatic stimulation gives most brilliant results, and successfully carries a precarious case to a speedy convalescence a sufficient number of times to justify the administration of the treatment in all indicated cases.

In those cases of acute alveolar abscesses presenting for treatment at that stage where the lightest touch is agony for the patient, the quickest method of checking the inflammation and reducing it to the point of permitting instrumental cleaning of the root-canals is to subject the affected side of the jaw to several exposures of blue- or ultra-violet light rays, at the same time applying the rubber applicator of an electrical vibrator to the cervical lymphatic glands of that side.

In lieu of either or both of the abovementioned methods, it is well to instruct the patient to refrain from putting any sort of application on the face, but to sit, if possible, with the affected side exposed to the direct rays of the sun for five or ten minutes several times a day, and to stimulate the cervical lymphatics of that side by the use of a little hand rubber massage mallet—or even an ordinary hollow rubber ball inclosed in a handkerchief could be used for the purpose. One to two hundred quick, gentle strokes are usually sufficient for one of the two or three treatments necessary. In unusually severe cases the patient may be instructed to stimulate the axillary lymphatics of the affected side in the same way.

Aside from the positive benefit that results from these measures, the patient's attention is diverted from the seat of trouble, and he is kept busy with a process that gives relief in proportion to the enthusiasm of its administration.

It is now universally admitted that the exposure of any infected tissue to the sun's rays unquestionably inhibits, and in many cases of continuous exposure destroys, the pathogenic bacteria present—the sun being the world's greatest germicide—while the judicious stimulation of the lymphatics contiguous to the affected area increases both their power of drainage and the process of phagocytosis.

These remedial measures are suggested, and have been successfully used in personal practice, in addition to the classical local treatment in general vogue for the pathological conditions mentioned. There is no intention whatever of offering any substitute for thorough and painstaking local work on affected teeth, but rather that we should add to our present methods additional means of more speedily accomplishing the return of diseased conditions to the highest degree of normality possible under the circumstances. In conclusion, it may be said that experience justifies us in not expecting to obtain uniform or invariable results from any therapeutic system; and lymphatic stimulation through mechanical vibration, like all other therapeutic measures, demands for its successful application a sound pathology, accurate deductive reasoning, and good common sense. While we cannot positively accept all that has been asserted regarding its field and its possibilities, neither can we reject it, and further observation will be required before a final decision can be reached.

The hope is expressed that this article will at least prove fertile in its suggestiveness, rather than in its supply of specific detail.

Discussion.

Dr. L. G. Noel, Nashville, Tenn. I realize that the hour is late, and I shall therefore only open the discussion. I am sorry that some of the gentlemen appointed to do so have not responded. In my opinion you have not had a paper before this association of more importance than this, nor one that is more scholarly and scientific. It seems to come in most opportunely to cap off the work we have had in the section tonight. We are all interested in the how and why. Dr. Harlan today has shown what can be done with the blue light, and Dr. White has alluded to the importance of massage treatment. I think Dr. Rhein also alluded to the importance of massage. In this paper we are told why we accomplish certain results, and why we see such results follow massage.

I can do little more than commend the paper and the manner in which it has been brought before you, and hope that some of those more competent to discuss the subject will respond.

Dr. J. Y. Crawford, Nashville, Tenn. I did not expect to say anything on this paper, but we have certainly been very well entertained by the exhibits made on the screen, and the essayist has spoken along very practical lines. I have always been pleased with Dr. White's work in dental surgery, as he exhibits a very high type of excellence in whatever he does. I had the pleasure of seeing one of the cases exhibited on the screen, and I can say that the results were very satisfactory indeed, from the standpoint of my judgment. I think, however, that the principal value of Dr. White's paper, added to its pleasing presentation, is the very marked suggestion that he threw out—alluded to also by Dr. Rhein—as to the importance attaching to the question of differential physical diagnosis. I am very well satisfied that a great many of the cases that come under the care of the dental surgeon could be treated by pursuing a more conservative course. I think there is a tendency to go a little too far, owing to the anxiety and the enthusiasm of the dental surgeon.

I am sorry that Dr. Rhein has left the hall, for I want to make some remarks in regard to the theories he presented.

If I understood him correctly—in which case I must hold that his teaching is erroneous—the major teaching of his remarks was that it is a very common thing for the apical end of a root of a tooth to be bathed in pus with a living pulp in it. According to my experience clinically, I must say that it is a very rare thing for the end of the root of a tooth to be enveloped in pus and the pulp remain living in that canal. I do not pretend to say that such a thing does not exist as a pus-investment of the entire end of a root of a tooth, and yet vitality remain. The vital structures, and particularly the nerve tissue, are remarkable in their power of resistance to the progress of disease action as a rule; but how often have the older practitioners seen the vitality in the palatal root of an upper molar destroyed and a provisional zone of partition thrown across the pulp-chamber, and the two buccal roots living. All men have seen that who have been long in practice. Show me a dental surgeon who has not observed such conditions, and I will show you one who either has not had much practice, or else he is a very poor observer. These things do occur, gentlemen, but to say that they are common occurrences in practice is erroneous teaching.

With regard to the diagnostic value of the radiograph: If I understood him correctly, Dr. Rhein said that by means of the radiograph he proposes to show the different pathological changes taking place in the tissues within the time covered by that radiograph. Later on he told us that that white zone or field was an indication of pus. Now, gentlemen, if that be true in every picture that he showed us, there was pus all around the teeth.

I was very much interested in the composition and statements made in that last paper, for if there is anything in the world I like, it is clinical reports. Not many practitioners know how to make a clinical report. The average person presenting a case announces the diagnosis and then reports the case. He should first report the case, and then give his opinion as to the diagnosis. Why? Because you should want everybody to study the case with you. I tried to cultivate my powers of diagnosis in keeping with the valuable suggestions of Dr. Rhein, and by listening to the statements he made and looking at the pictures, tried to make up a diagnosis of the cases, but he gave his diagnosis before he told us all.

When Dr. Allen read his paper, I tried to determine whether it was hydropathy or osteopathy, or what it was he was teaching, but I do not know. But I will tell you, gentlemen, if I had a case of pulpitis that was not amenable, not in a few days but in a few minutes—a case where the lymphatics were involved—well, bring such a case in here to me tonight, and if I don't afford relief to that case in twenty minutes, I will quit practicing dental surgery. How many dental surgeons have not had many cases of the type he presented here tonight, which were the result of pent-up pus! One step more, clinically: I do not believe that the surgeons of the world, and particularly the dental surgeons, have ever grasped the significance of the immense amount of force developed in the process of inflammation that takes place in and around the teeth. The amount of force developed in the process of inflammation and the formation of an abscess is often sufficient to burst a tooth, and many teeth are split open under it. Has not every dental surgeon observed what I call your attention to tonight? If not, one

of two things is sure; either he has not had much experience in such cases, or he is a very poor observer. Every dental surgeon has opened an upper lateral incisor and seen the pus come boiling out. Perhaps in another case they will open a tooth and the pus will not come out. Why? The elasticity of the structures around the tooth has been so overcome that they do not respond; while in the other case the structures are so elastic that they squeeze the pus out. Every practitioner has seen this. Now, instead of pummeling that fellow with a sore jaw, give vent to this pus area, and let nature do the rest.

Dr. M. F. Finley, Washington, D. C. I would like to say just a word, not so much on the paper as on the last discussion. It seems to me that our friend Dr. Crawford has misinterpreted the cause of pain in the cases that the essayist presented. In a great many cases pain is present when there is no pus, or we might say with certainty that in the majority of cases where pus has formed the pain ceases. The stages preliminary to the formation of pus are the ones in which the greatest pain is encountered. I think it is quite reasonable in a discussion of this kind to give credit for discrimination in the diagnosis to the one who prepares and presents a paper. One of the greatest drawbacks to successful practice is the failure to make a proper diagnosis. Dr. Crawford would have us believe that all cases of pain result from pent-up pus, when in reality there is nearly always a cessation of pain when the inflammation has existed sufficiently long to produce pus. It is to stop the inflammation in its early stages that the treatment suggested by the essayist is here offered, in the hope of cutting short suffering and pain. Our main effort should always be to give relief at the earliest moment possible, and it seems to me a plan is here suggested which will improve our present methods. It is worthy of careful consideration.

Dr. H. T. Stewart, Memphis, Tenn. I have listened to a good many discussions on Riggs' disease, or so-called pyorrhea, but I have not heard in a long time so interesting a discussion as we have heard tonight. I was glad to hear it, but was sorry for one thing, viz, that we seem to have forgotten one man to whom is due more credit than to any other for arousing interest in this line of work. I have noticed for the last year or so that I have heard scarcely a single reference to this man's name in our discussions of pyorrhea and saving of teeth, and I want to pay my humble tribute to that man tonight, and take off my hat to him. I refer to that great, but erratic and exceedingly sensitive man, Dr. D. D. Smith of Philadelphia—a man who has done more to stimulate the profession to the saving of teeth than any other man. I will not stop to eulogize Dr. White, for his dear friend Dr. Noel has done that better than I could possibly do. I want to thank Dr. White for his paper, and Dr. Rhein—who has also done great work in prophylaxis, and who has been doing it even longer than Dr. Smith—for his discussion.

I want to take exception to two or three things; one is that in Dr. White's paper, as in nearly all papers on Riggs' disease, we find emphasis is laid on the removal of deposits. I have always asserted that this is not the chief thing in the cure of the disease. I used to think that it was deposits, and I labored to remove the deposits only. They assuredly should be removed, but men who remove deposits only, do sometimes what we do not take into question—they tear up the

tissues and stimulate new tissue, and afterward apply stimulating medicines to the edges of the alveolar border. I have experimented a great deal along this line, and in a great many cases I have tried to see what results I could get by leaving the deposits alone, and have often obtained results that would astonish me.

Another thing: I think it is altogether wrong to assume that it is local treatment only to which we should direct our attention. I believe that is false teaching. A good many years ago, when I read my first paper on Riggs' disease—and by the way I want to say that I object strenuously to the name pyorrhea as being misleading; and while I do not like the name of Riggs' disease, it is at least not misleading—I stated that in a large percentage of cases we have no pyorrhea at all, but in Riggs' disease we cover the ground. Whether there is pus present or not, it is Riggs' disease. I wish we had a better name, but we have not. Dr. Noel took me to task at the southern meeting in Memphis last year for calling this condition Riggs' disease. I asked for a better name, but Dr. Noel has not given us one. Some present have heard me before cite some cases in which the catarrhal conditions prevented the cure of the case. I want to say today that the catarrhal condition of the mucous membrane of the mouth in the treatment of Riggs' disease is something that cannot be controlled by lactic acid or the removing of the deposits; this is something that is not taken into consideration as it should be, and consequently accounts for the return of the disease in many instances.

Dr. Noel says it cannot be cured, but I say that it can be cured. I remember one case that I treated in which I obtained very good results at first from local treatment, but the patient returned. A specialist from New York city examined the case and found a deflected septum, which caused the man to breathe through his mouth, producing an unnatural condition which kept the mucous membrane of the mouth irritated, and which prevented the cure of the disease. It was easy to cure after the man was operated on, and his normal breathing restored.

Dr. White says he gives very few drugs. I think it is a good thing to give drugs when it is essential. Several years ago I was a most radical advocate of local treatment, but the more I see of this disease the more I am inclined to enter into the systemic treatment, with the aid of the physician when necessary. Dr. White also speaks of flushing the sewers and getting the patients to drink water—cold water I believe he said. Is that right?

Dr. White. Yes, cold water, but not ice-water.

Dr. Stewart. That is a good thing under certain circumstances, but there are other parts of the body to be considered besides the sewer. Nature calls for water when she needs it, and the way to get patients to take large quantities of water is to have them take plenty of exercise. But the thing to be impressed is this: they should not only drink water, but should put their bodies in a condition to call for water. The skin should be stimulated and the blood given free circulation, and then you naturally drink water and in that way flush the sewers, and not only them, but the bloodvessels, arteries, and the veins. I have seen serious systemic disturbances follow the drinking of large quantities of cold water in trying to flush the system. If it be necessary to drink large quantities of water, it should be hot water, as a rule.

Speaking of systemic conditions and systemic treatment reminds me of a case I have reported several times, that of a banker; and, by the way, there were no deposits on these teeth whatsoever, and yet it was one of the worst cases of Riggs' disease I ever saw. How are you going to cure a case of that kind by simple local treatment—by removing the deposits? I treated the case, meeting with fairly good success, and thought I was getting along beautifully, when after a little while I had a reverse; there was a profuse flow of pus that I could not manage at all. The patient was living an indoor life; I tried to scare him into getting out of doors, by telling him that not only his teeth were concerned in the matter but his entire well-being. He began to take outdoor exercise for two or three hours a day, and I again had fairly good success. However, in the course of two or three months he returned to me with his mouth in possibly a worse condition than it was in the beginning. I tried almost everything I could think of, and at last I put the man on colchicin—something we know very little about. We do not know the effect it has on the system, but we do know that when used empirically it often has a wonderful effect on gouty conditions. That was about five years ago, and that procedure, together with the local treatment, produced a cure, and we have had no further trouble from the case since.

One of the gentlemen sitting near me tonight called to my attention a case that I mentioned before a dental society some time ago. It was the case of a man who had suffered from Riggs' disease for several years, until he became discouraged. He came to me and I began local treatment, but met with very little success. I inquired into his habits, which seemed to be perfect. He was almost a model man—did not smoke, kept regular hours, took a great deal of outdoor exercise, living out in the country—and I could not account for it. He seemed to have no particular ailment, and in obtaining his family history, I questioned him as to his diet, and was told he was very fond of molasses. I asked him how fond he was of it, and he told me he ate it three times a day and a great deal at every meal—that he could not do without it. I suspected that that was the trouble, and I at once cut off the molasses, with but simple treatment, and the man recovered. Dr. Johnson told me shortly afterward that he had heard of many fiendish operations, but he had never before heard of cutting off a man's molasses in order to cure his Riggs' disease.

Dr. White (closing the discussion of his paper). I thank the association very much for the kindly way in which they have received my paper. I am free to confess that I am somewhat of an enthusiast on the subject of pyorrhea, and while Dr. Noel does not agree with me as to its cure, I still believe nevertheless that it is like many other diseases in that respect. Pyorrhea develops under certain conditions, just as other diseases do; when we change these conditions and treat the patients, we cure the disease. If the patient is negligent and adopts a careless way of living, and drifts back into this same condition—in other words the condition that produced that disease originally—he will naturally have a return of the disease. As I said in my paper, you would not say of a patient coming from a malarial district, that he could not be cured; for if you change the conditions and climate he will be cured, while if he goes back to a malarial district he may have malaria again. So with

many other diseases, and this has been my observation with regard to pyorrhea.

As regards Dr. Rhein's radiograph, I think there is possibly a field for it in the study of diagnosis, but I also think that it will have to be developed to a very much greater degree than it is at the present time. I have for a long time hoped that we might have a light of some kind which we could pass immediately back of a tooth, and so locate perfectly the place where the deposits happen to be. It may be that the radiograph will reach that state of perfection where it can be depended upon, but I do not think at present that the radiograph is distinct enough to be of very much value to us in the diagnosis of pyorrhea. There is no question that it is a very valuable adjunct in surgery, and also in dental surgery in locating impacted third molars and unerupted teeth.

Dr. G. V. I. Brown, Milwaukee, Wis. I am very glad to say that I have seen these cases of Dr. White's, and I want to say that they look better in the mouths than on the screen. Such results as I have seen in Dr. White's office I think I have never met with anywhere else, especially when I have had the opportunity of discussing with the patients the changes that have taken place in their conditions during the course of five, ten, and fifteen years after the treatment. I was glad to have Dr. Allen bring the suggestion to this section along the line of this paper. It is not a question of how to bring about this lymphatic stimulation, so long as you do bring it about. We have had several papers before the section, and it occurs to me that this is a timely thought that we have our attention directed along that line.

Dr. Allen (closing the discussion of his paper). Dr. Crawford misinterprets my ideas, as I never thought of advocating the stimulation or the pounding of inflamed tissues; that I would consider malpractice. I spoke only of stimulating the contiguous tissues. I said common sense, deductive reasoning, and sound pathology would be necessary in order to have good results from this treatment. One who did not know thoroughly what he was doing would get himself and the patient into trouble by the careless or thoughtless application of such methods as I have advocated, and I am glad to make this point clear, that any direct stimulation of diseased tissue is likely to make the condition worse. We want to draw away the serum that results in pressure on the nerve filaments and causes pain, whether an abscess threatens or not. I thank Dr. Finley for emphasizing the fact that where there is pain there is not always necessarily pus. When the adjacent lymphatic glands of any inflamed tissue are stimulated, then unquestionably the inflammation will be affected to the same degree that the glands are stimulated. There is, however, a point beyond which the glands should not be stimulated—a point at which stimulation ceases and irritation begins; and there the questions of common sense and the personal equation of the operator become paramount. I may say that my ideas are yet imperfect, and I hope some day to present clinical examples, and make more clear the ideas that I am now struggling with.

The next order of business as announced by the chairman was the reading of a paper by Dr. E. P. Dameron, St. Louis, Mo., on "Oral Hygiene in the State Association." Dr. Dameron was not present, and his paper was read by Dr. J. P. Corley, as follows:

Oral Hygiene in the State Association.

By E. P. DAMERON.

THE state association is of the greatest importance to the dental surgeon and to the public. To the dental surgeon it is, in a way, a clearing-house, where practitioners from all sections of the state assemble and old and new subjects in dentistry are reviewed. This interchange of thought and the demonstrations of operative and prosthetic work are of undoubted value, and as the dental surgeon is benefited, so in turn is the public benefited. The time is approaching when every active member of the profession will be expected to belong to his state society, and will be looked upon with suspicion by his patients if he does not.

Dentistry as a profession is advancing with rapid strides, and he who fails to keep in touch with his fellow practitioners will soon be left behind by the onward march of progress.

One of the many topics that is receiving much attention is that of the preservation of the health of the teeth and mouth. Endeavoring to learn what work had been done along this line in the past year, programs of state society meetings in fourteen states were examined, and in each of six of these was found at least one paper or clinic—sometimes more—upon the subjects of oral hygiene, prophylaxis, and care of the teeth, being nearly fifty per cent. of those at hand—a very encouraging outlook. Several state associations have a permanent committee on oral hygiene, as should every state, sectional, and national society.

More attention, however, is as yet given to operative and prosthetic technics than to prophylaxis; more to restoration than to prevention, and this condition will probably continue until the thought "clean teeth do not decay" is instilled in every person. Every individual should know that by his own negligence he is subject to inconvenience. A majority of the people of high and low degree are not sufficiently interested in the care of their teeth; oral hygiene is not widely known and fully appreciated by them, but should it become popularized, instruction would be more sought after than disregarded.

In the advancement of oral hygiene three things in particular are to be overcome: (1) Lack of care in parents or guardians; (2) lack of interest, and perhaps knowledge, on the part of the family physician; (3) lack of instruction and training by the dental surgeon. Indifference, ignorance, and prejudice in parents often prevent the benefits that might be derived by children from proper education in the public schools upon this subject, and yet there is perhaps no better way to overcome these obstacles than by persistent and careful instruction.

Every state society should endeavor to have oral hygiene taught in the public schools of its state. Much good has already resulted from such action. The medical profession has not given the care of the teeth and mouth as much attention as should be given to this subject, but many medical schools have arranged for lectures upon dental topics, so that in the future there may not be so much lack of interest and knowledge by those who enter the practice of medicine. Those already engaged in practice are not to be reached in this way, however, and there could be no better way than that the state

dental association memorialize the state medical society, calling special attention to oral hygiene, prophylaxis, and dental pathology.

In a general way most of us have practiced prophylaxis, but systematic care of the teeth and mouth with a view of prevention of their affections has been advocated for comparatively but a few years. As our knowledge of disease increases, the truth of the old saying "an ounce of prevention is better than a pound of cure" becomes more and more apparent. Preventive dentistry is now advocated by many of our progressive dental surgeons, who through prophylactic and hygienic measures have accomplished much toward decreasing, if not preventing, caries of the teeth, in many instances reducing carious action fifty per cent. and reducing the number of other oral ailments to an even greater degree. But there are many engaged in the practice of dentistry who do not attend society meetings, and seldom, if ever, read a dental journal; thus within the confines of our own profession we find a large field for missionary work. Oral hygiene as advocated today is unknown by many. How then can they give proper instruction and training to those coming to them for treatment? There can be no doubt that it is the province of the state association to look after these indifferent brothers, and for the good of the public supply them with information pertaining to this subject. Many state societies, as already stated, have a standing committee on oral hygiene, but in many instances a "walking delegate" with a "big stick" would be required to spread our gospel.

The general apathy of the public concerning the care of their teeth and mouth is to be deplored, but in a measure is excusable; but apathy in a member of the profession is inexcusable, and cannot be too strongly condemned. While many state societies are endeavoring to spread a knowledge of oral hygiene and the outlook is most favorable, they are somewhat impeded by lack of official literature upon the subject, and it would no doubt be a good plan for the National Dental Association to supply the text of a treatise upon oral hygiene and prophylaxis, which the various state societies could adopt, and urge upon boards of education to adopt as the standard in dental instruction.

To arouse and stimulate interest in this subject among members of the profession, each state association might arrange an essay contest, in charge of the oral hygiene committee, the essayist receiving the highest number of points to be rewarded by a special vote of commendation by the society—or by any plan the society saw fit to adopt. The essential thing is to create interest in oral hygiene in the profession, in the medical profession, in the schools, and in the home.

Articles upon the care of the mouth and teeth are appearing with increasing frequency in many periodicals throughout the country, indicating a growing appreciation of this work. The value of the public press as a means of spreading the knowledge among the laity should not be overlooked, and each state association should avail themselves of it, and not leave such matters to "beauty doctors" and irresponsible uninformed writers.

There are many ways in which this subject can be presented to the public. Many suggestions have been made and commented upon at length before state and national societies. Much beneficial work has already been accomplished. The crusade for sound teeth, pure breath, and healthy bodies is well begun. The

time is at hand for the National Dental Association to supply much needed literature, enabling state societies to proceed with complete accord to advance the cause. Do not delay. Do it now.

Discussion.

Dr. J. P. Corley, Greensboro, Ala. For the only paper I was able to hear I would like to say a few words, not on account of that, but because of the value of the paper. One member of our committee, Dr. Taylor, objected to the effort of the other members of the committee to get the state association to appoint standing committees to take charge of the work within their own bounds; because, as he said, most associations were dominated by political machines, and it would be unwise to take the chances of having politicians take up the matter in a local way. He favored the appointing of men who were members of scientific bodies, medical societies, and universities, and recommending them to the societies for appointment on these committees. He thought we had a sufficient number of men conspicuously prominent in their own territory along this line. And so he would not support the measure proposed by the committee. Finally, in my strenuous desire to get the matter in some form before the various associations, I proposed that these men be nominated by the lay dentists, instead of being appointed by the president of the society, thus taking it out of the hands of the politicians, and putting it into the hands of the lay dentists. These men were nominated by the lay dentists, and were elected to membership on these committees by the society. This method worked admirably in my own state, and we nominated and elected three of the best men in the state. Our hope is that each society will take up this matter in the same way, and in a year that each society will have standing committees on this subject. One of the most important advantages from this would be that the lay dentists would be goaded to the point where they would be careful as to their own teeth. My own experience is that the majority of the dentists of my acquaintance are not very particular as to their own sanitary measures, and I think this is one of the advantages gained.

The national committee should have auxiliary committees in every state society, and the state society committees may have auxiliary committees in the local societies, and their duties will be to get good articles and clinics on this subject before every state association.

There being no further business, the chairman declared Section III adjourned *sine die.*

THE CLINICS.

Dr. J. A. Gorman, Asheville, N. C. "Orthodontia."

Dr. Gorman exhibited a large number of casts showing malocclusion of the teeth, and the conditions after treatment.

The clinician laid special stress on—(1) The importance of studying first of all the occlusion of the molar teeth. (2) The importance of beginning the treatment as soon as possible after the eruption of the first molars, and of getting these teeth in their proper positions. (3) The simplicity of the appliances used. Only Angle's "D" bands and expansion arch and the Baker anchorage were used for correcting the malocclusion.

Dr. V. H. Jackson, New York, N. Y. "Orthodontia."

The clinician demonstrated his system of correcting irregularities of the teeth. He showed the method of constructing appliances, first describing the manner of preparing a cast. An accurate cast is made, and the teeth are carved slightly at the neck, which causes the appliance, when made, to fit closely, thus insuring good anchorage.

The appliance consists of partial clasps, spring clasps, base-wire, finger springs, lugs, etc., assembled on an accurate plaster model, on which they are finally soldered. Spring-clasp attachments retain the appliance in position by grasping the anchorage teeth. They are made by first arranging partial clasps on the lingual sides of the molars and bicuspids used for anchorage. The partial clasps are made of pieces of 18-k. gold plate, No. 36 standard wire gage, contoured to fit the side of the tooth, usually the lingual side. The gold is roughened on the side on which the solder is to be applied.

The spring clasps are of No. 21 or 20 wire, either of gold, silver-nickel, platinoid, or German silver. They are shaped to fit the side of the tooth opposite to that against which rest the partial clasps near the gum. The ends of the spring clasps passing over the arch follow closely at the junction of the teeth, and rest on the partial clasps, to which they are finally soldered. A large wire known as the base-wire or body of the appliance is shaped to cross the arch, following the palatal curve, and the ends of the wire are bent at nearly a right angle, forming the "arms." These arms rest on the partial clasps, to which they are soldered with spring clasps. To this anchorage

portion of the appliance, springs of any form are united with solder. They are shaped to extend like fingers for the purpose of moving any of the teeth in the arch as desired.

The base-wire crossing the palatal arch is termed the palatal base-wire; when it follows the lingual curve of the teeth it is termed a lingual base-wire, and when it is arranged to pass on the labial and buccal sides of the teeth in the arch a labio-buccal base-wire.

The method of soldering with chemically pure tin, using the soldering iron, was described.

Casts and apparatus were presented showing the ease with which the arches of the jaws and teeth are equalized with the Jackson appliances and rubber elastics. Casts and appliances of numerous cases were presented, showing the conditions before and after regulating, and the extensive movement accomplished in from two to eight visits.

Dr. A. W. Doubleday, Boston, Mass. "Combination Inclined Plane and Retaining Appliance."

This appliance (Fig. 1) is constructed to take the place of those which have heretofore been composed of all metal, and have the plane soldered to the anterior portion of an appliance which is cemented to two or more teeth; for the reason that with such an appliance a great many of the shredded or fibrous foods give no end of disturbance. In most cases where this appliance has been used, the arch has been expanded and the anterior aspect of the mouth greatly modified, often to the extent of rotating one or more teeth. A vulcanite plate forms the substantial part of the appliance and covers the roof of the mouth, including the first molar. A platinized gold plane (with suitable attachments soldered to the back) is vulcanized in the correct position so as to properly draw the mandible forward at each closing of the mouth; also a platinized gold or German silver wire of from No. 16 to No. 21

Fig. 1.

gage (according to pressure desired) is vulcanized into the plate, extending out through the approximal spaces between the canine and the first bicuspid, and across the labial surface of the six anterior teeth.

The plate serves as a retainer for the expanded arch. The inclined plane at the same time modifies the bite, which in most cases, especially in persons under twenty years of age, will have become fixed in from six to eight weeks, so that this portion of the appliance may be removed. The anterior wire serves to retain the arrangement of the anterior teeth, and pressure may be increased or relieved on any of these teeth by a slight shaping of the wire with contouring or other suitable pliers.

Figs. 2, 3, and 4 show an example of results obtainable with this appliance. It

may be removed by the patient at will for cleansing the teeth. Hearty co-operation and appreciation on the part of the patient make it unnecessary to cement this appliance to the teeth in order to have it continuously worn.

Dr. A. M. Jackson, Macon, Ga. "Contour and Occlusion Obtained with Cast Fillings Without Waxing or Investing."

After having secured a good matrix, thicken it with 22-k. gold solder, and then cut a strip of 22-k. or 24-k. gold plate one-sixteenth of an inch wide, and tack the end of the cervical margin of the matrix by re-flowing the solder. Place the matrix in position on the tooth, and with pliers bend the strip of gold to conform to the outline of the area with

Fig. 2.

Fig. 3.

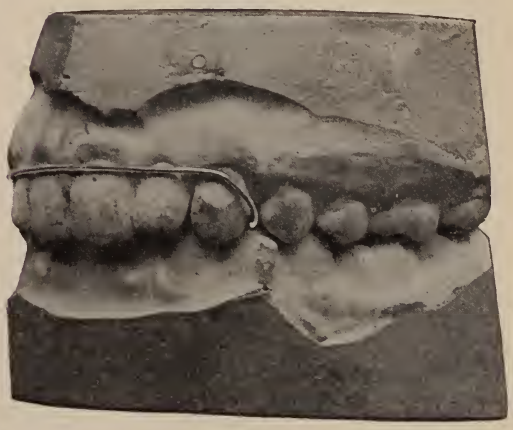
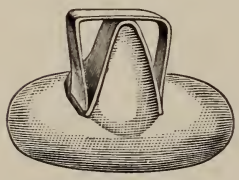


Fig. 4.

which the filling should come in contact. Burnish the margins of the matrix and remove it from the tooth. The result thus obtained is shown in Fig. 1.

Fig. 1.

Fig. 2.



To protect the matrix and to facilitate handling, a bit of investment material is used, as shown in Fig. 2.

The next step is the flowing of the 20-k. solder between the matrix and the

Fig. 3.

Fig. 4.

outline band until the desired result is obtained, as shown in Fig. 3. One side of the inlay shown at Fig. 3 has been polished, but the other side is shown just as the soldering was completed, to show how the solder will cling to the outline strip.

Fig. 4 shows a single contour with the strip in position ready for the soldering. This little strip of gold may be used to contour or raise the cusps of bicuspids or molars by means of cast fillings. A piece of iron wire, secured into the investment material at one end, is of great value as a means of handling during the final soldering.

Dr. I. N. Carr, Durham, N. C. "Combination Filling of Tin and Gold."

Dr. Carr demonstrated the properties of Ambler's cohesive tin, filling a large compound cavity in a lower molar by building the filling with successive layers of tin and gold. He then removed the filling and cut into it to show the cohesive property of the tin. He also filled a large approximal cavity with Ivory's "crystalia," a shredded tin, restoring the contour by building with the tin on cohesive gold. A cross section of the filling showed that the union was perfect.

Dr. W. H. Cudworth, Milwaukee, Wis. "Porcelain Inlay Restoration of a Central Incisor."

In making this restoration the clinician used Jenkins' porcelain, a platinum matrix, and an electric furnace. He obtained good contour, sharp corners, and fine color. Ames' special inlay cement was used for setting the inlay.

Dr. J. A. Hall, Collinsville, Ala. "A Temporary Lower Denture."

With a gutta-percha base and a cement body a temporary lower set can be easily constructed, and the denture worn immediately after the extraction of the teeth. It will protect the wounded tissues and aid in mastication. It will also sustain the lips in a normal position—thus retaining the original facial contour—and will aid in enunciation. Gutta-percha can be extended lower down on the ridge than any metallic or rigid plate, without lacerating the tissues with which it may come in contact. Gutta-percha is not, strictly speaking, an irritant, and is decidedly more cleanly than rubber. It also clings to the ridge with greater tenacity than a rigid plate, and the muscles and soft tissues will tolerate its presence without becoming inflamed.

In cases where necrosis or other causes have destroyed a large area of bone, leaving flexible tissue interwoven with muscular fibers which almost float in any direction, a base of gutta-percha is most certainly indicated.

Dr. E. P. Dameron, St. Louis, Mo. "The Use of Interchangeable Facings."

The clinician showed an upper anterior bridge of six teeth made with interchangeable facings. The abutments were Richmond crowns, reinforced by having the band of the crown extend down over the gingival margin of the facing, concealing the joint and increasing its strength. He also showed a porcelain-face bicuspid shell crown, using interchangeable facings. The shell crown is first constructed, the buccal surface cut away, and the backing of the facing soldered to the shell. The facing is then cemented to place. The same arrangement for the band at the gingival margin is followed as in constructing the Richmond crown described above.

Dr. C. H. Frink, Fernandina, Fla. "Porcelain Restoration of Malformed and Diminutive Laterals."

The tooth is prepared with a shoulder at the lingual aspect of the gum margin, sloping the surface at the labial aspect of the gum margin. A shell matrix is formed of platinum, after which a plain vulcanite tooth is approximately ground to fit by cutting out the pins and otherwise concaving the posterior surface. This porcelain shell is held in position with a small lump of hard wax, just warm enough to hold the matrix to the tooth-shell while removing it from the mouth. The matrix and tooth being held in a pair of locking tweezers, the wax is carefully removed, and the high-fusing body applied. After the baking is completed, the matrix is removed, and the inner surface etched with hydrofluoric acid and cemented in position.

This clinic was illustrated with a large plaster cast of an upper left lateral incisor of diminutive size.

Dr. F. E. Roach, Chicago, Ill. "Moldable Porcelain, Showing its Uses and Manipulation."

The principal field of application for this material is as a substitute for amalgam, in large restorations of molars and bicuspids, and especially in cases where, until the present time, gold crowns have been almost universally used; and also for perfecting the fit of the manufactured porcelain crown. The principal features are that it can be mixed to a

putty consistence and molded to any desired form, carved and baked without the use of a matrix. Its advantages are simplicity of manipulation, great strength, and an affinity for the cement when set.

Dr. H. T. Stewart, Memphis, Tenn. "Bridge Work in Pyorrhea."

Dr. Stewart demonstrated a system of crowning which he has devised for adapting bridge work to teeth badly affected by Riggs' disease. Each crown is made in two separate pieces, the pins and cap being made as for the Richmond crown, after the tooth is cut off even with the gum. This is applicable to the root of any tooth, either posterior or anterior. A second floor is now soldered on the first. The caps are now placed in position on the cast, the facing ground to place—facings can usually be used, even on molars—and backed. Behind this facing is built up in wax a spur which is wrapped about with 1/1000 platinum, and reproduced in 20-k. solder. Over this is then burnished or swaged a pure gold cap to an absolute fit. This and the facing are placed in position, the cap waxed to the facing, removed, invested, and soldered. The cap and pin are cemented on each root separately. The crowns are then placed in position, an impression is taken, and the bridge made entirely separate from the caps and pins. This bridge can be used either as a removable or fixed bridge. Among the advantages are—(1) Being able to shape the root and more accurately fit the bands. (2) The abutments are easily made parallel. (3) Each root can be dried and the cap cemented on separately without regard to keeping the other one dry. This is especially advantageous in first, second, and third molars.

The clinician claims to succeed in making and adapting abutments to teeth affected with Riggs' disease that it would be impossible to save by the ordinary systems of bridge work. The only objection to this beautiful and extremely hygienic system of bridge work is the great tediousness of its technique, which requires much time and skill.

Dr. J. H. Crossland, Montgomery, Ala. "Stomatic Prophylaxis."

This clinic was a demonstration of the method of Dr. D. D. Smith. The lower anterior teeth of a young lady were freed from a very extensive accumulation of calculi, and cleansed and polished until their surfaces were immaculate and smooth. The clinician used a scaler of his own design, one of Dr. Thorpe's, and others of different designs, all, except those used for breaking the thick deposits, being extremely small instruments. The cleansing and polishing were done entirely by hand, the Smith porte-polisher being used. Shoe-pegs, suggested by Dr. H. B. Harrell of Texas, and the usual orange-wood were used as vehicles for the pumice, as well as the following accessories, which have been suggested by the clinician: Small brush made for engine porte-polisher, with bristles cut short; "points" of cow's horn, gutta-percha, celluloid, whalebone, white hickory, black gum, Florida ironwood, and "vulcarbo," the latter incased in rubber tubing and held in the porte-polisher or set in celluloid handles. When rough-

ness or very tenacious stains necessitated a more effective abrasive, the vulcarbo points were used before the application of the pumice.

Very long and extremely thin and smooth orange-wood and hickory applicators were used in applying lactic acid. These, he claims, are very valuable also as detectors of calculi, a certain "grating, tearing" sensation being observed when they come in contact with them, owing to their softness and fibrous nature. Lactic acid, mixed with "balsamo del deserto" to stiffen it and cause it to remain longer in the pockets, was used. He has found that gum-arabic is also valuable as a stiffener for this agent. He advocates periodic—generally monthly—cleansing and massaging by hand, believing that stimulation is as potent a factor as is the cleansing, as shown by the splendid results obtained by Dr. D. D. Smith, of whose method of prophylaxis he is an ardent follower. The instruction in prophylaxis which we give our patients, with the inspiration often developed by it, is deemed by the clinician of more value than any service that may be rendered by the dentistry of the present period.

Dr. H. B. Tileston, Louisville, Ky. "Hollow Gold Inlays."

The clinic given by Dr. Tileston on the hollow gold inlay as applicable to molars and bicuspids consisted in the adaptation in the usual manner of a piece of pure gold, 36 gage or even thinner, to the cavity, carrying it thoroughly into the occlusal step, and allowing the edge to overlap the cavity at all points. The step portion is reinforced by packing with crystal gold while in the cavity, and melting into this a bit of 22-k. gold. An outer piece of equal thickness of pure gold is cut to fit just within the gingival margin overlap—the overlap is about one mm. wide—and is tacked at that point with a tiny bit of 22-k. gold. The piece is then replaced in the cavity, the matrix re-burnished, and a pledget or several pledgets of wet cotton are packed between the two pieces to force the outer piece to proper contact with the approximating tooth. The outer piece is then bent over upon the occlusal surface, and the patient is instructed to close tightly upon it, which adapts the thin gold to the occlusion. It is then removed, the outer piece trimmed so that its margin lies within the overlap of the matrix, the cotton removed, and the piece replaced in the cavity for correction. The margins are then soldered all around with 22-k. gold or 22-k. solder. A hole is cut in the matrix piece opposite to the axial wall, through which small pieces of 20-k. solder are dropped and melted in the flame of the Bunsen burner until the space between the walls of the inlay are nearly but not quite full, it being left partly hollow for the cement to enter when set. The approximal face of the inlay should be finished and polished before setting the inlay, the balance being finished afterward like a gold filling.

The advantages claimed are ease and quickness of construction, as neither an impression nor an investment is required; complete protection of the cement, the overlap covering the joint completely; and the freedom from thermal shock to the pulp of a vital tooth, because of the cement in the hollow space in near apposition to the pulp.

Dr. D. O. M. Le Cron, St. Louis, Mo. "Cavity Preparation for Gold and Porcelain Inlays, Showing Plaster Models."

Dr. Le Cron exhibited large size plaster teeth showing various cavity preparations for gold and porcelain inlays. Inlays made of brass accurately fitting the cavity represented gold inlays, and inlays made of plaster accurately fitting the cavity represented porcelain inlays.

Series 1. Models showing canine with disto-approximal cavity, and bicuspid with mesio-approximal cavity, with metal inlays. Inlays retained by dovetailing or grooving at suitable points, which if desired may be used for bridge abutments.

Series 2. Models showing the preparation of a cavity involving the entire incisal edge of a central incisor, and an inlay simulating porcelain, with two posts for retention.

Series 3. Models showing the preparation of a cavity in an incisor involving the mesial and distal approximal surfaces and extending entirely across the incisal edge, with plaster inlay showing the finished operation.

Series 4. Models showing the preparation of a cavity in an incisor involving the approximal surface and the incisal angle, and a plaster inlay showing the restored contour.

Series 5. Models showing buccal and lingual cavity preparation, and plaster inlays for such cavities.

Series 6. Models of bicuspids and molars showing approximal cavities not involving the occlusal surface, and plaster inlays accurately fitting such cavities.

Series 7. Models of bicuspids and molars showing preparation of approximal cavities involving the occlusal surface, with plaster inlays showing restored contour and contact.

Dr. W. R. Clack, Clear Lake, Iowa. "Gold Filling."

The cavity was in a mesio-occlusal surface of the upper left second bicuspid. An amalgam filling had been placed in the mesial surface. This had failed in its purpose for want of proper extension and retention. After removing it, the cavity was prepared as nearly after the G. V. Black system as was possible, although the progress of the decay had rendered impossible the squaring of the labio-axial angle. Three half-sheet cylinders of No. 4 annealed soft gold were placed in the gingival third of the cavity, and the filling was completed with annealed gold. The gold was then condensed with a No. 3 Wedelstaedt plugger, the stepping of the plugger having been from the center to the cavity margin. The plugger was held at an angle of ten degrees to the walls and cavo-surface angles. A hand mallet of three and one-half ounces weight was used. Interproximal space was gained by wedging the gold against the distal surface of the second bicuspid, and will be preserved by a contact point touching the same surface. Four and one-quarter sheets of No. 4 foil were used. The rubber dam was adjusted from the upper right central incisor to the first molar of the same side inclusive. A clamp was placed on the molar, but no ligatures of any kind were used.

Dr. J. V. Conzett, Dubuque, Iowa. "Gold Filling."

This clinic consisted of the insertion of a gold filling in the mesio-occlusal surface of an upper right first molar. The cavity margins were extended gingivally, buccally, and lingually into the areas of comparative immunity. The cavity it-

self was prepared with flat gingival and occlusal seats and parallel walls, making no undercuts or grooves, but relying for retention upon the general shape of the cavity and condensation of the filling material. After the cavity was prepared it was varnished with sandarac in order to insulate the pulp against thermal shock, and then the cavo-surface angle was carefully beveled all around the cavity. In filling the cavity non-cohesive gold foil was used in the gingival third, two quarter-sheet cylinders were placed in the bucco-gingival and linguo-gingival angles, and three half-sheet cylinders were forced in between them and the whole thoroughly malleted to place. After this the cohesive foil was started in the bucco-occluso-pulpal angle, and the gold was built forward and over the non-cohesive gold in the gingival third, effectually locking it to place. The hand mallet was used with a ten-pound blow, augmented by a hand pressure which varied from five to fifteen pounds according to the situation of the plugger in the cavity, the light pressure being used when great stress was not indicated, and the heavy upon the occluding surface. No previous separation having been obtained, and there being practically no interproximal space, it was necessary to obtain one, which was done by malleting the gold into the space against the approximating tooth, with the result that ample space was obtained.

In finishing the filling the non-cohesive gold was first sawed out of the interproximal space with a Black saw, and the filling was shaped with Wedelstaedt trimmers and a Black knife No. 7. After this the occlusal surface was ground to form with gem-stones, and the whole filling was polished with sand-paper disks, strips, and pumice on a rubber disk.

Dr. A. P. Johnstone, Anderson, S. C. "A New Method of Fitting Crowns and Making Inlays. Mounting Porcelain Crowns with Fixed or Detached Posts."

The crown was ground to fit the root a little under the gum line on the labial surface of the root, allowed to rest on the lingual surface, and it was ground away freely so that it would not touch the approximal surfaces. The prepared crown was used for taking the impression of the root with paraffin and wax. After the wax had hardened, the crown was removed and invested in two cups attached to the instrument especially devised by the clinician for doing this kind of work. A small button of low-fusing porcelain was made and slipped over the post of the crown, resting between the base of the crown and impression of the root. The instrument was then held in a good hot flame until the button became soft and plastic, when the cups of the instrument were gradually closed, thus molding the button to fit the face of the root. The operation produced a nicely fitting crown in a very simple and satisfactory manner.

Dr. D. H. Young, Attica, N. Y. "The Carbon System of Constructing a Porcelain-face Crown."

In presenting this crown I wish to call attention mainly to the points in which it differs from others, especially from the Richmond crown, because when completed it at first sight resembles more closely that particular crown than any other. These differences consist in the method of making the crown, as well as in the qualities which it possesses.

For convenience we will describe an upper central incisor crown:

Position of the Pin. Since the pin of the crown is its main anchorage and support, to this phase of the work should be given the proper amount of care. Pins of crowns are as a rule placed in about the center of the root, but in this crown that portion of the pin which protrudes from the root is placed at about one-thirty-second of an inch nearer the lingual than the labial side of the root. This change gives two desired qualities: It affords more room and freedom for placing the facing just where it should be, or use of a thicker facing if desired.

The strength and stability of any structure depend upon its foundation, and in the arrangement of the pin just described I believe we will obtain just these very desirable qualities. During mastication, force is exerted upon the lingual surface of the upper front teeth, upward and toward the labial side, and therefore it will be readily seen that the pin in such a position lengthens the load-arm of the lever, for the tooth and its anchorage being analogous to a form of lever, this arrangement makes it difficult for the crown to become displaced.

Removable Facing. The next point of difference is in completing the crown without subjecting the facing to the flame during soldering. In order to effect this, an impression is taken with the cap and pin in the desired position. The facing is ground to fit the space, and the back surface is beveled on the cutting edge at quite an acute angle. This will leave more space for the solder, and consequently greater strength will be gained. The backing material is now placed upon the facing and swaged or burnished to fit the latter perfectly, the backing being allowed to remain flush at the cutting-edge so as to give the surplus needed in finishing the piece. The backing is then carefully removed so as not to distort it, the surface that comes in contact with the facing is painted with whiting, and sufficient solder is placed upon the cutting-edge and flowed to raise it to the degree of fulness made necessary by the condition of the bite. After this the backing is placed upon the facing, and both are put in the desired position upon the cast; a little wax is flowed from the edges of the backing to the adjoining teeth, care being taken not to get any wax on the pins. It will thus be held in position.

The facing is now removed, a little more whiting is flowed over the pinholes to keep the wax from coming through, and as much wax is added to the other side as solder will be required in the finished crown—but the wax should not cover the cutting-edge, which already has sufficient solder. By the aid of a small drill the wax is bored out of the pinholes. In order to prevent the solder from filling up the pinholes, small carbons—which can be made from a hard lead pencil—are placed in the pinholes from the labial surface, allowing them to extend into the wax from one-thirty-second to one-sixteenth of an inch, but not so far as to prevent the solder from flowing on their ends and producing the complete contour. A second coat of whiting is usually added at this point, covering the carbons and sealing the joints around them, thus preventing any solder from coming through.

Now the case is ready to be invested, which may be done in the ordinary way. By slightly heating the wax it can be removed without disturbing the position of the backing. As no porcelain facing is present, the case may be heated up as rapidly as desired, and when the solder has flowed, without waiting for it to cool, it may be dipped in cold water and

separated in a short time. With the aid of a spear-pointed drill, the carbons and the solder which cover their ends are drilled out.

With a fissure bur held at an angle of forty-five degrees, each hole is cut toward its neighbor, in order that the pins may be bent toward each other. A slight film of cement, light or dark as may seem advisable to influence the shade of the facing, is placed on the occluding surface, and the facing is pressed into place. The pins are then bent toward each other into the slots made for them, and the excess is cut off. Bore out the opening left at the outer side of each pin by placing a drill in them at the same angle at which the pin is bent, and drill to the distance of one-thirty-second of an inch or less, as the case may indicate. Then, with a small retention bur, make this little cavity retentive by slightly notching the pin on one side and the gold on the other; fill this cavity with a pledget of gold or amalgam, and the result will be a facing that when cemented will be clenched and keyed. Finish it, and one is positive that he has a crown with a perfect facing, and with better joints, I believe, than it is possible to obtain by subjecting the facing to the flame. In addition, the color of the facing will not be changed, as may happen if subjected to the flame.

This crown is a sanitary one, for if in any way there should be a space between the facing and the backing which might absorb food débris, such a space will be filled by the cement. The cement also forms a perfect bed for the facing to rest upon, even at all points, and thus any possible strain through expansion and contraction is avoided—strain which by the ordinary method is often within a few pounds of the breaking-point.

In making a crown by this method the gold is not exposed to view if the contour of the gum is normal.

This method of attaching the facing I have successfully adopted in the construction of bridges.

Dr. Crittenden Van Wyck, San Francisco, Cal. "The Van Wyck Obtunder."

A disto-mesio-approximal cavity in an upper left central incisor was prepared for a gold filling painlessly by the use of this obtunder.

The result was secured by producing anesthesia in the tooth to be operated upon. A spray of perfumed ether is the liquid used. The device consists of three parts: (1) A combination dam-spreader with detachable nose-shield; (2) metallic tubes for delivering the spray, and (3) a glass receptacle for the liquid. After adjusting the rubber dam a piece of cotton is placed upon the tooth, and the spray is directed on the cotton, which is removed in about three minutes' time. The spray, now directed on the tooth itself, is allowed to continue during the entire cavity preparation.

Twenty pounds of air-pressure will produce the spray, and the evaporation of the ether will render the tooth so cold that three great advantages are secured: (1) Painless cavity preparation; (2) painless grinding for crowns, and (3) painless exposures. There will be no after-effects of any kind. Such a tiny spray is used that there is no possible chance for anyone to be affected by the ether, and the Van Wyck obtunder can be safely used on any person for any cavity or tooth needing attention.

Dr. F. G. Crouch, Atlanta, Ga. "Orthodontia."

The clinician showed a number of casts of cases at the beginning of the treatment, after it had been in progress for some time, and at the conclusion of the treatment. Success was attributed to the use of appliances suitable to each case, no one system being adapted to all cases. Special cases need special treatment, and some cases were shown wherein correction could be accomplished by the simplest means—as, for instance, in bringing inward and downward a projecting canine, when expansion is not needed; adjusting a round spring-wire over the canine backward against the first bicuspid and forward against the lateral wall. This when sprung into place gives three movements, and as the tooth comes into position the spring is opened from time to time—say twice a week—which the patient himself may do if properly instructed by the dentist.

A special case was shown of prognathism, due to mouth-breathing and thumb-sucking. Correction was accomplished in one year by using Angle's head appliance and retraction bar, and also by wiring the first bicuspid. A special congenital case was shown of retrusion. The models of the case during the treatment showed marked improvement after a few weeks. The maxillæ were very contracted, and the expansion brought about by the treatment was most marked antero-posteriorly.

Another case showed the Jackson appliance for causing expansion and bringing the lateral incisors into position. After several years on this line of practice, the clinician finds it more and more unnecessary to extract teeth for the correction of irregularities.

Dr. L. A. Smith, Port Gibson, Miss.

Dr. Gibson demonstrated a method of measurement for ordering facings, crowns, etc., for special cases, whereby the dentist may secure the required shape and color in ordering from the dental depots.

APPENDIX.

Constitution of the National Dental Association.

PREAMBLE.

We, the members of the American Dental Association and of the Southern Dental Association, do declare ourselves a Society to cultivate the Science of Dentistry, and have adopted the following Constitution and Rules of Order for our government:

CONSTITUTION.

(Adopted at Old Point Comfort, August 5, 1897. Revised and amended at Asheville, N. C., August 1903.)

ARTICLE I.

NAME.

This organization shall be known by the name of the National Dental Association.

ARTICLE II.

OBJECT.

The object of this Association shall be to cultivate the science and art of dentistry and all its collateral branches, to elevate and sustain the professional character of dentists, to promote among them a mutual improvement, social intercourse and good feeling, and collectively to represent and have cognizance of the common interests of the dental profession.

ARTICLE III.

MEMBERS TO BE OF THREE CLASSES.

Section 1. The members of this Association shall be of three classes, viz, permanent, delegate, and honorary members; the two former classes having equal rights and privileges, except that none but permanent members shall be eligible to office.

PERMANENT MEMBERS.

Sec. 2. Permanent members shall consist of those who, coming as delegates and complying with the requirements of the Association, shall sign a statement in a book to be kept for that purpose, signifying to the Treasurer a desire for permanent membership.

DELEGATE MEMBERS.

Sec. 3. All members shall be practitioners of dentistry. They shall be received only from permanently organized state dental societies. They shall be elected by ballot at some regular meeting of their society, and shall be members who have done some meritorious work for the profession; but no person shall be received as a delegate who is in arrears for dues to this Association.

Sec. 4. Honorary members shall consist of prominent, worthy members of the dental profession residing in foreign countries, who shall be elected by ballot.

Sec. 5. It is hereby specially provided that all persons at present permanent members of the American Dental Association and of the Southern Dental Association are permanent members of this Association, and entitled to all the privileges of the class to which they belong, without further action, and the Treasurer is hereby directed to transcribe their names upon the roll of membership of this Association.

ARTICLE IV.

DELEGATES FROM STATE SOCIETIES.

Section 1. Any permanently organized state dental society may send one for every six of its active members as delegates to this Association for one year, upon complying with the requirements of its Constitution;

but no society shall be entitled to representation that does not accept or substantially recognize the Code of Ethics of this Association.

SEC. 2. Each delegate shall present credentials which shall be approved by the Executive Committee.

SEC. 3. If the Committee on Credentials has knowledge that any applicants for membership are violating the Code of Ethics, said applicants shall not be received, but shall be referred by the committee to the societies whose delegates they are, and in no case shall this Association be compelled to treat with violations of the Code except the violator is a member of this body and has no membership in any local body.

SEC. 4. This Association will receive no delegates who, since August 1875, shall have entered the profession without having first graduated at some reputable dental or medical college.

ARTICLE V.

SIGNING CONSTITUTION.

SECTION 1. Each new member, before voting or speaking on any subject before the meeting, shall sign this Constitution, inscribing his name and the title of the society from which he receives his appointment. It is expressly agreed by each member in signing this Constitution that he will accept the discipline of a two-thirds vote of this Association.

DUES.

SEC. 2. The annual dues in this Association shall be five dollars.

DUES—TO BE PAID.

SEC. 3. No member is eligible to office, nor can he speak or vote in this Association, in any of its sections, or in any of its branches, until his annual dues are paid.

DUES—IF UNPAID.

SEC. 4. If the dues of any member remain unpaid for two years his name shall be erased from the list of members of this Association.

CONDUCT OF MEMBERS.

SEC. 5. Any act of special immorality or unprofessional conduct committed by a member of this Association shall be referred to the Executive Committee, whose duty it shall be to thoroughly examine into the case, and if the charges be sustained, to report to the Executive Council during the annual session at which the charges are preferred. Whereupon, by a vote of the Council the offending member may be reprimanded or expelled, a two-thirds vote being required for expulsion, a majority being sufficient for reprimand.

EXPELLED MEMBERS.

SEC. 6. Any member of this Association being expelled or suspended from his local society, shall from that date cease to be a member of this body.

RESIGNATION OF MEMBERS.

SEC. 7. Any member not in arrears may offer his resignation, upon the acceptance of which by the Council his membership shall cease; but the Council may at any time thereafter reinstate such member by unanimous consent. In case a member is dropped for non-payment of dues, two years' dues must be paid before reinstatement; nor shall he represent his society as a delegate until the two years' back dues are paid.

ARTICLE VI.

OFFICERS.

SECTION 1. The officers of this Association shall be a President, three Vice-presidents, Corresponding Secretary, Recording Secretary, Treasurer, an Executive Committee consisting of nine members, an Executive Council, consisting of the President, Secretary, and five members, three Chairmen and three Secretaries of Sections, to be elected as hereinafter provided.

SEC. 2. Each officer, except as otherwise provided, shall hold his appointment for one year, or until another is elected and qualified to succeed him.

SEC. 3. The President shall be chosen from the division in which the next annual session is to be held, and one of the Vice-presidents shall be chosen from each division. (See Article XII.)

SEC. 4. At the first election three members of the Executive Committee shall be elected from each division of the country, who shall hold office for one, two, and three years, respectively; afterward but one member shall

be elected each year from each division, and hold office for three years.

SEC. 5. One member of the Council shall be elected each year from the division in which the newly elected President resides, and two members from each of the others.

SEC. 6. At the first election after this amendment goes into effect, one Chairman and one senior and one junior Past Chairman for each section shall be elected. Thereafter one Chairman and one Secretary of Sections shall be elected each year from each division, and each Chairman of Sections shall be known as Junior Past Chairman for the first year and as Senior Past Chairman for the second year after the expiration of his time as Chairman.

SEC. 7. The names of places for holding the next annual session and the candidates for office shall be nominated by informal ballot of the Association. The three names that are highest, or in case of tie, four names having the greatest number of votes shall be the sole nominees. A formal ballot shall then be taken in which a majority of the ballots cast shall be necessary to a choice. If a choice be not made on the second formal ballot the name of the candidate receiving the fewest votes shall be dropped on the third formal ballot. The informal ballot may be made a formal ballot by a three-fourths vote of the Association. Provided that for the re-election of Recording Secretary, Corresponding Secretary, Treasurer and Secretaries of Sections a motion, seconded, that the Recording Secretary, or Treasurer, shall cast the ballot, shall be entertained, but if this fails to carry, nominations shall be made as hereinbefore specified.

ARTICLE VII—DUTIES OF OFFICERS.

DUTIES OF PRESIDENT.

SECTION 1. The President shall preside according to parliamentary usage as laid down in "Robert's Rules of Order" and the Rules of Order adopted by this Association, and shall present an annual address.

DUTIES OF VICE-PRESIDENT.

SEC. 2. In the absence of the President, one of the Vice-presidents shall perform the duties of the office, and in absence of these officers a Chairman *pro tem.* shall be appointed by the Executive Council.

DUTIES OF CORRESPONDING SECRETARY.

SEC. 3. The Corresponding Secretary shall attend to the correspondence of the Association with other scientific bodies, when desirable, and with the societies represented in this Association. It shall be his duty to obtain information of and report annually to the Executive Council, and with its approval to this Association, an account of the meetings held, the numbers of the membership and attendance, subjects discussed in papers, essays, or otherwise, by the societies represented in this Association, and such other matters of interest as may be well to incorporate in the proceedings of this body.

DUTIES OF RECORDING SECRETARY.

SEC. 4. The Recording Secretary shall keep accurate minutes of the proceedings of the Association, preserve the archives and unpublished documents, and attend to the other duties that pertain to his office. He shall be *ex-officio* Chairman of the Publication Committee, and shall see that due notice is given of the time and place of the annual sessions of the Association. He shall be secretary of the Program Committee, and see to the preparation and printing for this committee and its distribution to the members of all societies represented in this Association, and shall provide each newly elected official with a correct copy of this Constitution.

DUTIES OF TREASURER.

SEC. 5. The Treasurer shall hold all the moneys belonging to the Association, and shall keep an accurate account as between the Association and its members. He shall furnish bonds satisfactory to the Executive Committee. He shall attend the session of the Executive Committee at 9 A.M. on the first day of the annual session to receive dues, and shall attend at roll call to verify the lists of names upon payment of dues within the legal limits, and shall notify all whose names may be erased from the list of membership. He shall pay the drafts of the Secretary, countersigned by the President, and shall report to the Executive Committee, where his accounts shall be audited and by

whom his report shall be presented to the Executive Council, together with their own.

SEC. 6. All resolutions appropriating money, except for the legitimate expense of this Association, shall require a two-thirds vote of all the members of the Association present at a general session of an annual session.

ARTICLE VIII.

EXECUTIVE COMMITTEE.

SECTION 1. The Executive Committee shall be the business committee *ad interim* of the Association. They shall report to the Executive Council at each annual session, under the proper head, their doings for the current year.

SUB-DIVISION OF THE EXECUTIVE COMMITTEE.

SEC. 2. The Executive Committee shall meet after the election of new members to choose their own chairman and secretary, and to divide themselves into three sub-committees as follows, and for the purpose described:

FIRST DIVISION OF THE EXECUTIVE COMMITTEE.

SEC. 3. The first division of the Executive Committee shall include its chairman. It shall act as the Committee of Arrangements, and shall make suitable preparations for the meetings of the Association, consulting with the Program Committee as to its needs. It shall report to the Executive Council at its first meeting of the annual session and with its approval see to the carrying out of the arrangements during the annual session. It shall provide a book for the registration of members or visitors as they arrive; and it shall be their further duty to secure from the Treasurer a good and sufficient bond.

SECOND DIVISION—CREDENTIALS AND AUDITING COMMITTEE.

SEC. 4. The second division of the Executive Committee shall act as a committee on registration, and shall meet for that purpose at 8 A.M. on the first day of the annual session. They shall examine and verify the qualifications of members, including all violations of the Code of Ethics and the Constitution. They shall register the names of members or visitors as they arrive, with place of their residence and hotel address, and give them all necessary information regarding the arrangements for the meetings, the literary program and arrangements for entertainment, if any. They shall also act as the auditing committee for the year.

THIRD DIVISION—COMMITTEE ON VOLUNTEER ESSAYS.

SEC. 5. It shall be the duty of the third division to examine all essays, papers, or reports that may be referred to it by the Executive Council before presentation to the Association and to report to the Executive Council their approval or disapproval of such essays, papers, or reports in whole or in any particular parts, to the end that the time of the Association may not be occupied by the reading of irrelevant, unimportant, or improper matter.

REPORTS OF SUB-COMMITTEES.

SEC. 6. Each of these sub-committees shall report from time to time, as may be necessary, to the Executive Committee as a whole, who shall decide upon such report, if possible; but in case of their inability to decide upon any matter, it shall be brought before the Executive Council for its decision.

MEETINGS OF EXECUTIVE COMMITTEE.

SEC. 7. The Executive Committee shall, if possible, meet for consultation and arrangement of their respective duties on the day preceding the annual session of the Association. The Chairman may at his discretion summon the members thereof to a meeting for consultation or making reports, at any suitable hour during the annual session of the Association, and at any other time at the request of five members of the committee.

ARTICLE IX.

EXECUTIVE COUNCIL.

SECTION 1. The Executive Council shall be the business head of the Association during its annual session, and when it deems it necessary have charge of all its business matters whatever; and it will be its duty to take cognizance of the doings of any and all of its officers, see to the smooth working of all of its parts, and attend to all matters referred to it.

SEC. 2. The Executive Council shall meet at nine o'clock on the day of the first meeting of each annual session, to receive the reports of committees, and afterward by adjournment or at the call of the presiding officers and committees, for the transaction of other business of the Association.

SEC. 3. All matters not otherwise specially provided for shall be referred to the Executive Council without debate.

SEC. 4. The Executive Council shall report to the Association at each general session the results of their proceedings for ratification or rejection without debate.

SEC. 5. The President and Secretary of this Association shall hold the same positions in the Executive Council as in the Association.

SEC. 6. Five members of the Council shall constitute a quorum for the transaction of business.

SEC. 7. All meetings of the Council shall be public; the time and place for which shall be posted for information of the members. Members may be heard on any matter before the Council.

ARTICLE X.

LOCAL COMMITTEE OF ARRANGEMENTS.

SECTION 1. There shall be appointed by the President, annually, a committee of three, residing at or near the place selected for the next meeting, whose duty it shall be to assist the Executive Committee to procure rooms for meetings, and make such other local arrangements as may be needed for the Association.

VACANCIES.

SEC. 2. In case vacancies occur in the Committees or Officers of this Association by reason of absence from the annual session or otherwise, such vacancies shall be filled by appointment *pro tem.* by the President.

PUBLICATION COMMITTEE—HOW APPOINTED.

SEC. 3. The President shall appoint two members of this Association who shall act in conjunction with the Recording Secretary as the Publication Committee. The Committee shall be authorized to employ a sufficient number of competent reporters to furnish an accurate report of the proceedings of each meeting of Sections, and of each general session.

ARTICLE XI.

INSTRUCTIONS TO THE PUBLICATION COMMITTEE.

SECTION 1. The Publication Committee shall superintend the publication and distribution of such portions of the transactions as the Executive Council may direct, or the Committee judge to be of sufficient value.

They shall specify in the annual report of this Committee the character and cost of the publications of the Association during the year, to whom they are distributed, and the number of copies still on hand.

SEC. 2. Any report or other paper, to be entitled to publication in the volume of transactions for the year in which it shall be presented to the Association, must be placed in the hands of the Publication Committee in typewritten form within twenty days after the close of the annual session; and must also be so prepared that the proof sheets furnished the authors shall be returned to the Committee without material alteration or addition.

SEC. 3. Every paper received and accepted by this Association, and all plates or other means of illustration, shall be considered the property of the Association, so far as may be necessary for the publication in the transactions of this body.

DISCLAIMER.

SEC. 4. The Publication Committee is hereby instructed to print at the beginning of each volume of the transactions the following disclaimer, viz: "The National Dental Association, although formally accepting and publishing the reports of the various sections, and the essays read before the Association, holds itself wholly irresponsible for the opinions, theories, or criticisms therein contained, except when otherwise decided by special resolution."

ARTICLE XII.

SECTION 1. For the purpose of this Association, the United States shall be divided into three divisions, to be called the East, the South, and the West.

The East shall include New England, New York, New Jersey, Pennsylvania, Ohio, In-

diana, lower peninsula of Michigan, and Ontario.

The South shall include Delaware, Maryland, District of Columbia, Virginia, North Carolina, South Carolina, West Virginia, Georgia, Florida, Alabama, Mississippi, Louisiana, Texas, Kentucky, Tennessee, Arkansas, Oklahoma and Indian Territory.

The West shall include Illinois, Missouri, Wisconsin, upper peninsula of Michigan, Minnesota, Iowa, North Dakota, South Dakota, Nebraska, Kansas, Montana, Wyoming, Colorado, Idaho, Utah, Washington, Oregon, Nevada, California, Arizona, New Mexico, and Alaska.

PLACE OF MEETING.

SEC. 2. The place of holding the next annual session shall be determined each year by ballot of the Association at its annual session, in the general session of the third day, except that the place of meeting shall be in the West in 1898, in the East in 1899, and in the South in 1900, and thereafter in the order named, meeting in each section every third year.

ARTICLE XIII.

ORGANIZATION OF SECTIONS.

SECTION 1. This Association shall be divided into three sections, as follows:

The first section shall have charge of prosthetic dentistry, crown and bridge work, orthodontia, metallurgy, chemistry, and allied subjects.

The second section shall have charge of operative dentistry, nomenclature, literature, dental education, and allied subjects.

The third section shall have charge of oral surgery, anatomy, physiology, histology, pathology, etiology, hygiene, prophylaxis, materia medica, and allied subjects.

SEC. 2. It shall be the duty of each member to identify himself with one or more of the above-named sections, and he shall inform the Recording Secretary of his choice at the time of joining the Association.

SEC. 3. The Secretary shall assign members to the sections in which they are expected to work if they shall fail to make their own choice before the close of the general session of the second day of the annual session.

SEC. 4. It shall be the duty of the Recording Secretary to keep a list of the members of the sections and to furnish copies of the same to the officers of the sections.

SEC. 5. The Chairman of each section shall preside at all of its meetings; shall exercise general supervision over its business, and shall see that the labors of his section are so conducted as to secure the best results. In the absence of the Chairman the senior or junior past Chairman shall preside. (See Article VI, Section 6.)

SEC. 6. The Secretary of each section shall keep full and accurate records of the doings of his section, shall have charge of the stenographic reports, and report the same to the Recording Secretary each day, as soon as possible after their approval by his section.

SEC. 7. For information of all members a list of the names of members of sections shall be published in the transactions of each year.

ARTICLE XIV.

MEETINGS.

SECTION 1. The meetings of this Association shall be known as annual sessions, general sessions, and meetings of sections.

SEC. 2. The annual sessions shall begin on the first Tuesday in August of each year and continue four days.

SEC. 3. The general sessions shall be meetings of the whole membership in attendance upon the annual session, and shall be held as follows:

The first general session shall convene at 10 o'clock on the first day and shall stand adjourned at 1 P.M., unless adjourned earlier. During this session the functions appropriate to the opening of the annual session may be performed, and the annual address of the President delivered.

On the second, third, and fourth days the Association shall convene in general session at 12 o'clock, noon, and stand adjourned at thirty minutes past one, unless adjourned sooner.

SEC. 4. In the general sessions any member may introduce matters of business, if seconded, which must then be referred to the Executive Council without debate, provided that any member, opposed to such matter of business or motion, with a second, may call for a vote on such reference. A vote shall then be taken without debate, and if

decided in the negative, that shall dispose of the matter for that annual session.

SEC. 5. The general session shall receive reports from the Executive Council as the first order of business, after the reading of the minutes, and shall approve or annul any matter of business or motions referred to it by the Executive Council by vote without debate.

SEC. 6. The election of officers of the Association shall be held at the general session of the third day of the annual session, and newly elected officers presiding over the general sessions shall be installed at the close of the general session on the fourth day, and those presiding over meetings of each section at the close of the last meeting of the section during the annual session.

SEC. 7. At the second and fourth general session there may be presented such addresses or reports as may be determined by the Program Committee, with the approval of the Executive Council, but these shall in no case occupy more than one hour of the general session.

SEC. 8. Sections 1, 2, and 3 shall each meet in separate rooms at 2.30 o'clock on the first day of the annual session for the reading and discussion of such essays, papers, reports, or for clinics, as may be determined upon by the Program Committee, with the approval of the Executive Council. Thereafter similar meetings of each section shall be held at 9 A.M. and 2.30 P.M. each day of the annual session. Evening meetings of the sections may be held as determined by each section.

SEC. 9. No business of any kind not strictly pertaining to the proper carrying out of the literary, scientific, or clinical work of the sections shall be introduced or considered in the meetings of the sections.

ARTICLE XV.

PROGRAM COMMITTEE.

SECTION. 1. The Committee on Program shall consist of the President, Secretary, the Chairmen of sections, and the two last past Chairmen of sections. It shall be the duty of this Program Committee to keep close watch over the progress of dental science and literature, and to arrange with competent persons in the profession who are members of this Association, or with persons of known ability in closely allied subjects in science not members, to prepare and read or to discuss essays, papers, contributions, or perform such clinical demonstrations as will tend to the improvement of dentistry. It shall report to the Chairman of the Executive Committee what special preparations may be needed for carrying out the program that may be arranged or contemplated.

SEC. 2. The senior past Chairman, junior past Chairman, and Chairman of each section shall, subject to the Committee, act as a Sub-Committee having especial charge of the program of that section, the responsibility in this work being in the order named.

SEC. 3. The President of the Association shall be President of the Program Committee, or, when present, shall preside over meetings of a Sub-Committee. The preparation of the program for the general sessions shall be under his charge. In meetings of the Program Committee, in the absence of the President, the senior past Chairman of sections present shall preside, seniority beginning with the division in which the President resides and following the order of rotation.

SEC. 4. The Recording Secretary shall act as the Secretary of the Program Committee and shall have charge of the preparation, printing, and distribution of the programs. He shall announce at each general session the arrangement of the program for the next general session; and also the program for each of the sections for the next twenty-four hours.

SEC. 5. The Program Committee shall meet for consultation regarding the next year's work as soon as possible after the election of officers, and hold such meetings thereafter on the call of the President or Secretary, as may be deemed necessary to the efficient carrying out of the work.

SEC. 6. The Program Committee shall report to the Executive Council at its first meeting on the morning of the first day of the annual session the program arranged for approval, and thereafter shall hold such meetings as may be necessary to arrange from day to day for the smooth working of the presentation and discussion of the matter of the program in the general sessions and meetings of sections.

ARTICLE XVI.

QUORUM.

Twenty members shall constitute a quorum in this Association.

ARTICLE XVII.

SUSPENSION OF RULES—THREE-FOURTHS TO VOTE.

The regular order of business may be temporarily suspended by a three-fourths vote of all the members present, for the consideration of a specific subject, upon the completion of which the regular order shall be at once resumed.

ARTICLE XVIII.

BRANCHES.

SECTION 1. For the wider diffusion of the benefits of this Association, the members of each division may form themselves into one or more separate bodies, to be styled "Branches."

POWERS AND OBLIGATIONS.

SEC. 2. Branches shall have such powers and privileges, and be subject to such obligations, as shall be determined upon from time to time by the National Association in annual session.

SEC. 3. Each Branch shall be free to hold meetings and to govern itself as its members shall think fit, but no Branch law shall be valid which in the opinion of the National Association may contravene any fundamental law of the Association.

SEC. 4. Each Branch shall pay its own expenses, and no Branch shall be deemed for any purpose the agent of the Association, or have power to incur any obligation in its behalf.

SEC. 5. Each Branch shall furnish a copy of its proceedings, including papers and discussions, for publication with the transactions of the National Association.

SEC. 6. Each Branch may receive delegates from societies within its division upon the same conditions as the National Association, and such delegates shall have the same standing in the National Association as though admitted directly from the state societies.

DUES.

SEC. 7. The annual dues of members attending the Branches shall be paid to the Branch Treasurer. Three-fifths of the dues may be retained for the benefit of the Branch. The remaining two-fifths shall be paid over to the Treasurer of the National Association.

SEC. 8. The annual session of any Branch shall be omitted whenever the annual session of the National Association shall be held in its division.

ORDER OF BUSINESS.

FIRST DAY.

8 A.M.—Meeting of the Executive Committee.
8 A.M.—Meeting of the Program Committee.
9 A.M.—Meeting of the Executive Council.
10 A.M.—Meeting in general session.
Report of Executive Council.
Report on Program for next general session and for each section for next 24 hours.
President's Address.
1 P.M.—Adjournment of general session, unless sooner adjourned.
2:30 P.M.—Meetings of sections for literary and scientific work.
8 P.M.—Meetings of sections for literary and scientific work.

SECOND DAY.

9 A.M.—Meetings of sections for literary and scientific work.
12 NOON—Meeting in general session.
Reading of Minutes.
Report of Executive Council.
Report on Program.
Address, or Reports.
2:30 P.M.—Meetings of sections for literary and scientific work.
8 P.M.—Meetings of sections for literary and scientific work.

THIRD DAY.

9 A.M.—Meetings of sections for literary and scientific work.
12 NOON—Meeting in general session.
Reading of Minutes.
Report of Executive Council.
Report on Program.
Selection of next place of meeting.
Election of Officers.
1:30 P.M.—Adjournment, if not adjourned earlier.
2:30 P.M.—Meeting of sections for literary and scientific work.
8 P.M.—Meeting of sections for literary and scientific work.

FOURTH DAY.

9 A.M.—Meeting of sections for literary and scientific work.
12 NOON—Meeting in general session.
Reading of Minutes.
Report of Executive Council.
Address, or Reports.
Installation of Officers.
Appointment of Committees.
Final Reading of Minutes.
Adjournment of the Annual Session.

AMENDMENTS.

The Constitution, Rules of Order and Order of Business of this Association may be altered or amended at any annual session by unanimous consent of the members present, providing notice has been given in writing at a previous meeting of the annual session at which the amendment is proposed; or by a vote of two-thirds of the members present, providing notice of the alteration or amendment has been given in writing at a previous annual session.

STANDING RESOLUTIONS.

The following standing resolutions are in force at this time:

1. Resolved, That a paper presented to the Committee on Voluntary Essays, and by them considered and returned to the writer with notification that the said paper is not accepted, cannot afterward be read before the Association unless it is made the special order by resolution adopted.

2. Resolved, That this Association discountenances the giving of banquets, excursions, entertainments, etc., by local professional societies or individuals, either during or at the close of our annual meetings.

3. Resolved, That it is unprofessional to use on cards or signs anything except name, title, and address.

4. Resolved, That this Association now in session direct that sections belonging thereto shall in the future be prohibited from inviting individuals who are violating the Code of Ethics to hold clinics or to give other exhibitions before this body.

5. Resolved, That a standing committee of three be appointed, to be known as the Committee on Terminology, whose duty it shall be to prepare and submit a carefully prepared report at each annual meeting of this Association.

6. Resolved, That this Association believes the conferring of honorary degrees in dentistry to be detrimental to the profession of dentistry, and hereby expresses its disapprobation of the practice.

7. Resolved, That a committee of three be appointed by the chair to co-operate with the officers in charge of the Army Medical Museum and Library in enriching its store of dental literature and specimens, especially by appealing to dental societies and individual members of the dental profession for assistance.

8. Resolved, That the National Dental Association condemns the use of secret preparations known as "*local anesthetics*," as well as all other secret preparations.

9. Resolved, That the secretary or other officer of each society sending delegates to this Association is expected to make a general report of the work done by the society he represents during the year, giving the subjects of the papers read before them and digests of the same, and to send said reports to the Secretary of this Association at least three weeks before the date of each annual meeting; the reports to be forwarded to the chairman of the section to which they belong.

10. Resolved, That any member of the dental profession who has been in reputable practice for a period of fifty years may be elected to permanent membership in the Association without payment of dues, and any member of this Association who has been in practice for a like period shall have his dues remitted thereafter by presenting the fact to the Treasurer of the Association.

11. Resolved, That lists of the ex-presidents of the American Dental Association and of the Southern Dental Association shall be published annually in the Transactions of the National Dental Association, and that all members and officers hold the same relations to the National Dental Association that they did to the former associations.

RULES OF ORDER.

1. On the arrival of the hour of meeting, the President shall take the chair, call to order, and announce that the meeting is open for business.

2. No motion or speech shall be in order until the mover or speaker shall have been recognized and assigned the floor by the chair, nor shall a motion be open for debate until seconded and stated by the chair.

3. No one shall be permitted to address the Association before giving his name and residence, which shall be distinctly announced from the chair; nor shall he speak more than twice, nor longer than fifteen minutes in all, unless by consent of the Association.

4. At the request of any member a motion shall be put in writing.

5. At the request of five members a question shall be divided or the yeas and nays ordered.

6. When a question is under debate no other motion shall be in order, except—1st, to adjourn; 2d, to lay on the table; 3d, the previous question; 4th, to postpone; 5th, to commit; 6th, to amend—and these motions shall take precedence in the order here stated.

7. The previous question and the motions to adjourn, to lay on the table, and to postpone, shall be decided without debate.

8. A motion to adjourn shall always be in order, but no member can make such a motion while another is speaking or while a vote or ballot is being taken.

9. A second amendment to the main question shall not be in order until the first is disposed of, nor shall there be an amendment of an amendment to an amendment.

10. After a motion has been seconded and stated by the chair, it shall not be withdrawn without the consent of the Association.

11. No member shall interrupt another while speaking, except to raise a point of order.

12. When called to order, a member shall sit down until the point of order is decided by the chair, or, in case of appeal, by the Association. If the point of order be sustained, the member can proceed in order by the consent of the Association.

13. Every member shall vote upon a question unless excused by the Association.

14. When any motion, except to adjourn, has been rejected, it shall not be renewed without unanimous consent.

15. Any member who on a question voted in the majority may move a reconsideration of that question; but if that motion shall be lost or laid upon the table, it shall not be renewed without unanimous consent.

16. The President may vote with the members upon all questions, but having so voted, shall not give the casting vote in case of a tie.

17. Motions for filling blanks shall be put in the order in which they are moved.

18. On a division, or in voting by yeas and nays, any member may change his vote before the result is declared.

19. These rules may be suspended by unanimous consent.